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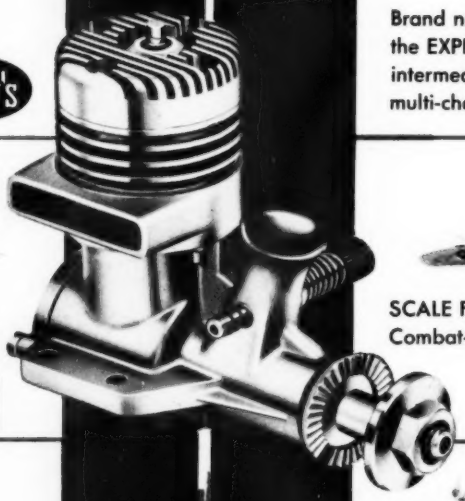

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Foreign Notes

BELGIUM

As briefly reported last month, in the 1958 European Control-Line Internationals held at Brussels, Belgium, the Hungarians, competing against 13 other nations, once again topped the results list and so added the Criterium d'Europe Grand Prix team award for control-line flying to their World Free-Flight Championships wins, a quite remarkable season's performance.

The five-day meet was held at Etterbeek, where the Belgian controlling body, the Federation de la Petite Aviation Belge, now has a really excellent site with two permanent circles and "pits" for the contestants. Events were for FAI Speed (.15 motors), Jet Speed, Stunt, Combat and Team Racing. There was much interest in Speed, due to the fact that this was to the newly revised FAI rules calling for much larger lifting surfaces. Models are now near to "60" size, with wingspreads of around 20 in.

It has to be admitted that this drastic increase made very little difference to maximum speeds at Etterbeek and take-offs were much less tricky. Some speed fliers found the large area something of an embarrassment at speeds approaching 130 mph, where the extra lift resulted in oversensitive control response, but further attention to model design and trim should pay dividends here.

Winner of the event proved to be Toth of Hungary in the excellent time of 134.2 mph, followed by Beck, Hungary, with 132.9, both using specially built, disk-valve racing motors. The Czechs, usually at the top, filled the next three places, with delta-wing models powered by the hitherto unassailable MVVS, followed by two Italians, the Russian, Vassilchenko (using a Czech MVVS) and two more Italians. The Italian Super-Tigre G.20V was, in fact, the only Western commercial motor of any consequence, its best time being 126.7 mph, by Rossi, for 6th place.

The stunt event, flown to the FAI rules (easier than the AMA pattern) had been expected to run in favor of the Western entrants, but, once again, the East Europeans were well to the fore and the winner was Gabris of Czechoslovakia. He used a Czech MVVS .35 cu. in. disk-valve glow motor, but the next seven places were shared by four Fox 35's (Belgium, Hungary and Germany), an O.S. Max-35 (Germany) and two McCoy 35's (Hungarian and Austrian). American influence was very marked in stunt model design, especially in the Palmer type configurations of the Hungarian and Russian entries.

In the Team Race, things were evened up a bit by a convincing performance from the British team, Edmonds winning in the record time of 4:58 for the 10 kilometers (an average speed of nearly 75 mph including stops) followed by Italy's Taddei, Belgium's Stouffs and Hungary's Azor. All four used the Oliver Tiger .15 diesel.

In the Jet Speed class, only one entrant, Russia's Ivannikov, actually flew. He clocked 171.5 and later went on to set a new world record of 186.4 mph. He used the Russian RAM-2, a large, low-frequency pulse-jet having a nominal static thrust of 5½ lb.

(*Continued on page 52*)

30th Year of Publication

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by William Winter

► Whether or not the US will do better at the 1959 International contest is a wheel-of-chance proposition. Talk being cheap (and have you seen the prices of balsa lately?), this ancient modeler isn't making any bets. Having passed on more model material for magazines than any man alive (well over a half million bucks worth), know beyond shadow of a doubt that most of today's contest airplanes simply are not what they should be. Some terrible crates win at the Nats, as well as some pretty good ones.

Winning a contest over here always was too easy, in free flight or rubber. The year-in, year-out expert who has a reliable ship, is a consistent flier, does have a bit of an edge over the rest of the rabble who try to out luck him. "Lucking out" gets you nothing outside this thermal country.

During the 1957 Nats at Philly, 15 guys had perfect scores in FAI gas. You'll never see anything as "good" at the International finals where the world's best modelers fly it out. But you could have taken all 15 crates to Cranfield in '58 and probably none would have scored five maxes. We build to win under our conditions, even when the models won't be flown under our conditions for how, otherwise, can you win the eliminations?

Bob Hatschek, describing his Mulvihill winner ('57 and '58), said the ship (unlimited rubber) was designed for a practical five minutes. A more temperamental design might do seven minutes, but, as the confirming results eloquently proved, the sure-fire five-minute airplane was good enough to win the Nats two years running. Talked with a veteran Wakefielder recently who told of a meeting with Joe Bilgri at the Westhampton, N.Y., finals in 1954. Joe urged him to try his multi-spar wing. Four years later, our man used Bilgri wing construction on his standard Wakefield and duration jumped 30 seconds. Korda, Lanzo, and the Cleveland people won with such wings all during the thirties!

We no longer develop airplanes. If a ship flies ok—that's it! Would a longer moment arm be better, or a thicker wing, different angular set-up, different force arrangement, more dihedral? Who knows? Who cares? For ultimate performance you've got to develop, patiently, with determination. Hungarian Benedek's Wakefield, for instance, has special airfoils for the 50-gram rubber rule. Over here—there's a difference?

One gassie that went abroad had a wing warp, (*Continued on page* 61)

NEXT MONTH'S COVER Curtiss Condor

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PLANE ON THE COVER

Probably the all-time favorite cabin light plane is the Monocoupe 90A, familiar sight at airports before the second great war. It was fast (130 mph) on its 90 hp Lambert radial engine. Span was only 32 feet. Had side-by-side seating, a range of 580 miles, and touched down at 45 mph, not much more than Cub landing speed. Rate of climb was 600 feet per minute.

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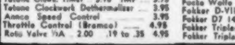

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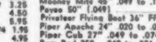

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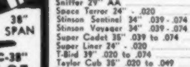

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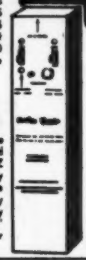

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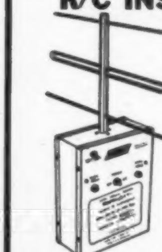

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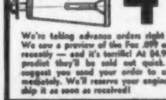

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At Belmont Park, N. Y., in 1910, an oldtimer prepares his Bleriot model. Electric motor spins the propeller. (Underwood & Underwood photo.)

1906 the wonderful 1910 years

by ELLERY LANIER

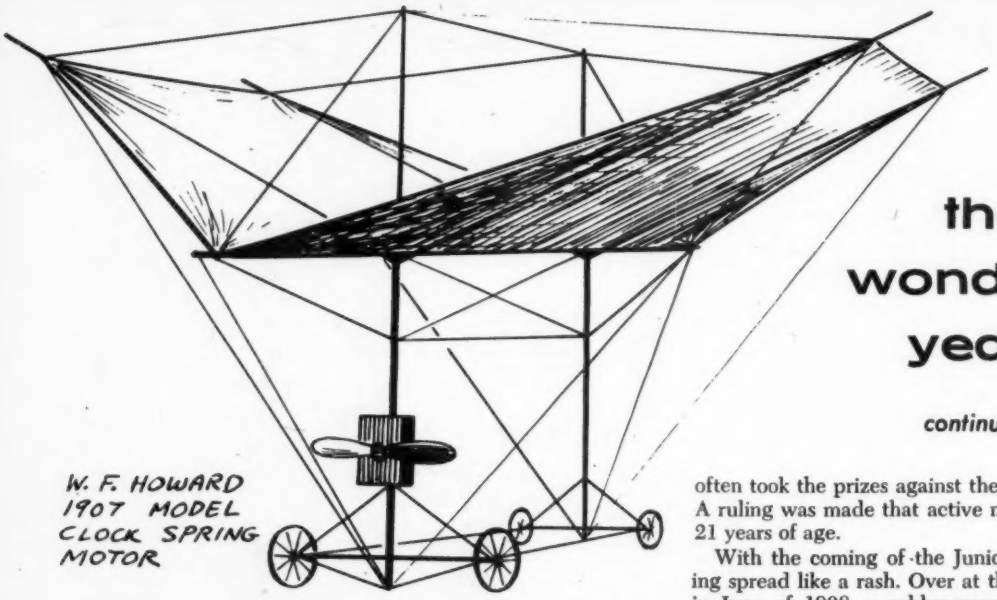
Three years after Kitty Hawk, contests, both indoor and outdoor, abounded. Gas engines, spring motors, rubber strands spun the props on many amazing crates.

► Before the Wright Brothers' first flight and, until the end of the first decade of the twentieth century, model airplane clubs mushroomed all over the world. This sudden mass enthusiasm for model plane making was no accident. Model airplane building was not unknown before the turn of the century. Before his death in 1880 Alphonse Penaud had built a successful small rubber powered model. In May 1896 Langley flew his powered model above the Potomac River, and Edwin W. Smith had flown a rubber powered model with landing wheels in 1901.

The most important years in the start of model airplane clubs are those from 1906 to 1910. In January of 1906 the first American exhibit of model airplanes was held by the Aero Club of America, at the 69th Regiment Armory in New York. But this was not yet a model club. By 1907, the next year, individual model plane makers were popping up in cities and farms all over the country. For example, in August of 1907 a Mr. William Morgan of Fort Plain, N.Y., was busy making flying machines of paper that flew very well. They had two propellers in front powered by rubber bands. On October 1, 1907 George A. Laurence of Sayre, Pa., flew a real contraption type model, 200 feet at a height of 15 feet.

The bug had caught on in England where, on April 15, 1907, the Aero Club held a contest at the Alexandra Palace that attracted a crowd of a thousand people. Of the 29 entries, 15 competed for the prizes. One of the rules stipulated that a model must weigh not less than two pounds and not more than fifty pounds. Prizes were: 1st—$750, 2nd—$375, 3rd—$100. From a starting altitude of not more than five feet, the model airplane had to fly at least 50 feet. No plane at the contest could win the first prize, so the prize money was held to be awarded at future meets. However, a second prize was awarded to A. V. Roe, and a third prize to W. F. Howard.

Roe's winning model was driven by a single propeller powered by twisted rubber mounted in a long triangular framework. Indoors it flew about 80 feet at a height of about a foot above the floor. Mr. Howard's machine was



W. F. HOWARD
1907 MODEL
CLOCK SPRING
MOTOR

the wonderful years

continued

a single plane bent to form a dihedral angle. Its light kite-like construction had one small propeller at the front that was driven by a small clockwork spring. Mr. Howard's machine made its longest flight in the open, over 100 feet against 75 feet in the morning indoor trials.

Of the many machines entered in the contest the favorites in order were—the aeroplane, the flapping wing machine and the helicopter. A great deal of trouble was caused by the spoiling of the twisted rubber strands under the effect of heat and strain. As they expressed it, "any model has a 'critical speed' necessary for complete equilibrium and slight variations can cause disasters." Of the 15 prize competitors, 11 used twisted rubber, one used a clockspring, one used a rocket; two had small gasoline motors, but the motors developed all kinds of trouble and the models failed to become airborne.

In the United States, it was February 1908 when the Junior Aero Club was first being organized under the directorship of members of the Aero Club of America. On the advisory board were Lee S. Burridge, Thomas S. Baldwin, Wilbur R. Kimball, A. Leo Stevens, and Ernest L. Jones. Headquarters were at 131 West 23 Street in New York City. As stated in its constitution, the object of the Junior Aero Club was to: promote interest in and encourage the study of Aerial Science among young people and to hold exhibitions and contests of apparatus designed for the purpose of aerial locomotion, voluntary or involuntary, made or owned by its active members. It was planned to include the subjects of wireless telegraphy, telephony, etc., as they related to the science and art of aeronautics. The club planned to hold many national and international contests.

The first national contest was planned for May 30, 1908. It was for distance flights of small "pilot balloons", starting near New York. The balloons were filled with hydrogen and contained notes requesting the finder to return them to the Junior Aero Club Headquarters in New York. Prizes were for greatest distance achieved, and for ingenious systems of ballast disposal. Clever ideas for ballast disposal were—a chunk of ice that would lighten the balloon by melting and draining out, or boxes of sand with timed release valves.

The Junior Aero Club was finally organized under the direction of Miss E. L. Todd, the only woman with a world wide reputation as a model plane builder. To form a branch, it was necessary to have 10 members. An exhibit was planned for May 30, 1908. At these contests, the boys often took the prizes against the competition of their dads. A ruling was made that active members could not be over 21 years of age.

With the coming of the Junior Aero Club, model making spread like a rash. Over at the Stevens Balloon factory in June of 1908, a rubber-powered model built by Carl Hartman, achieved a straight and flat flight of 400 feet at a height of six feet. It weighed ¾ of a pound and lifted an additional three ounces. It had two propellers in front and its supporting surface was one square foot. The wings and the motor were tilted up and down without changing the level of the frame of the model.

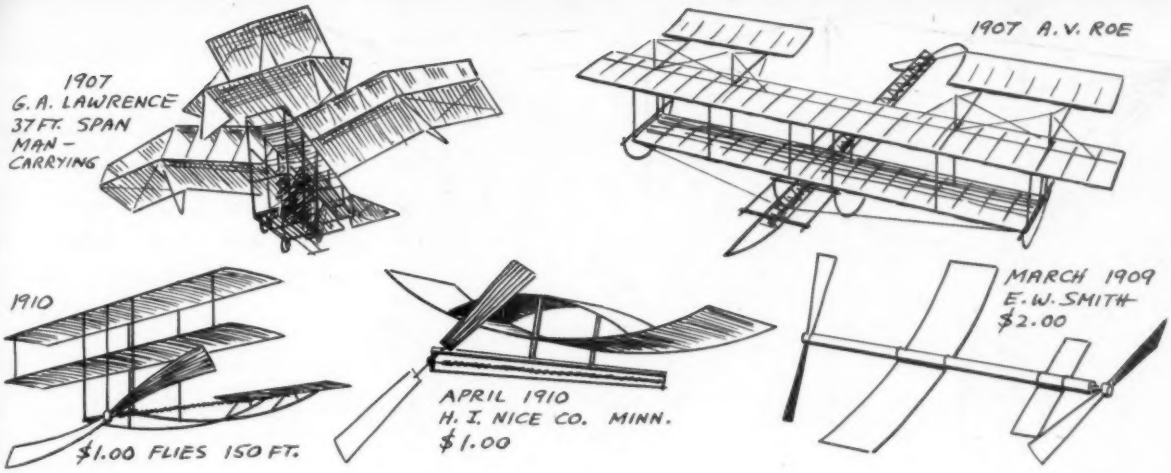
On December 18, 1908 the Junior Aero Club held an exhibit in connection with the Toy Show in Madison Square Garden. It was given permission to hold its regular practice meetings at the 71st Regiment Armory in New York, in February of 1909. A branch was organized in San Francisco by Virgil Moore and then more branches started popping up everywhere.

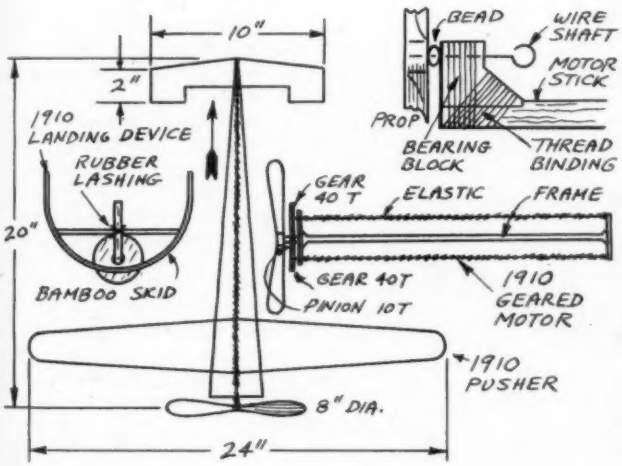
Plans for the first annual exhibit were announced in January 1909. Mailings were sent out asking for contest entries of models, drawings and photographs, and also announcing that prizes would be awarded. These circulars also said that a board of aviators would be appointed with Harold N. Platt as president. This board would receive and care for the models. The models were to be sent to 131 West 23 Street, New York, Room 19, where they would be kept safely. At this time the membership list had branches in 11 states:—N.Y., Mass., Conn., N.J., Md., O., Ill., Mo., Col., Or., Wash.

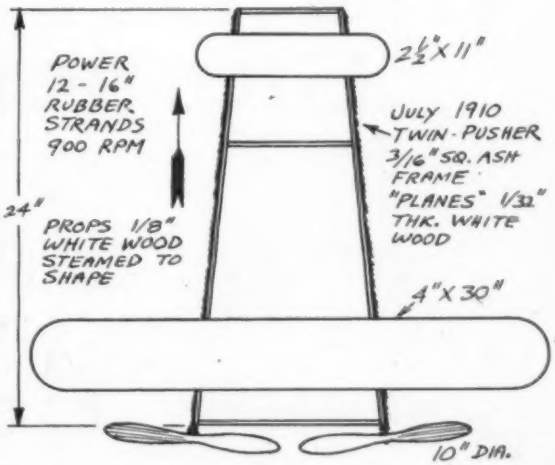
In April of 1909, Miss E. L. Todd withdrew and the office of president went to Walter H. Phipps, the earliest reporter of Model Plane Club activities in America. In that same month a new chapter of ten young men was organized at Fond du Lac, Wis.

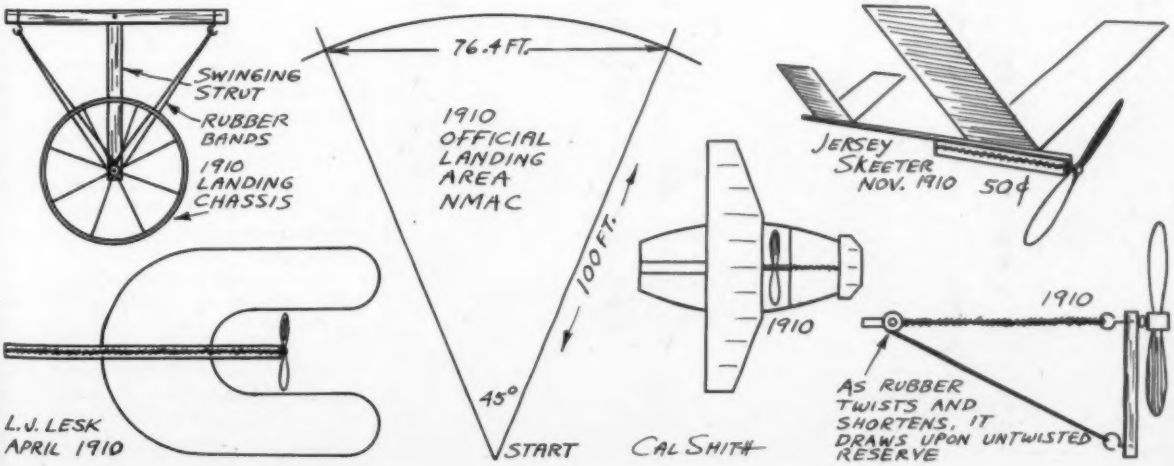
Weird looking models appeared. On June 26, 1909 a very odd model was flown at an exhibit of the aeronuatical society by F. O. Andreae of Central Valley, N.Y. For its trial flight, it was hoisted up 300 feet by kites on a 2,000-foot piano wire. When 1200 feet of the wire had been unreeled, the plane was released by a hook and ring arrangement. It was equipped with a steam motor and measured 10 foot by 10 foot, and weighed 35 pounds. It maintained its flight for only a few minutes.

The first ads for model airplanes appeared in April 1909. The H. I. Nice Co. of Minneapolis advertised a miniature flying machine. This machine was to be hand launched and if you started it upside down it was supposed to right itself. It measured 14 inches across, five inches high, six inches long and weighed less than one ounce. The ad claimed that it would fly over 100 feet in a circle or straight away. The price was $1.00, which was rather high for that time. (*Continued on page* 38)


1907
G. A. LAWRENCE
37 FT. SPAN
MAN-
CARRYING
1907 A. V. ROE
1910
$1.00 FLIES 150 FT.
APRIL 1910
H. I. NICE CO. MINN.
$1.00
MARCH 1909
E. W. SMITH
$2.00


10"
2"
1910
LANDING DEVICE
RUBBER
LASHING
20"
BAMBOO SKID
BEAD
WIRE
SHAFT
MOTOR
STICK
PROP
BEARING
BLOCK
THREAD
BINDING
GEAR
40 T
ELASTIC
FRAME
GEAR 40T
PINION 10T
1910
GEARED
MOTOR
1910
PUSHER
8" DIA.
24"

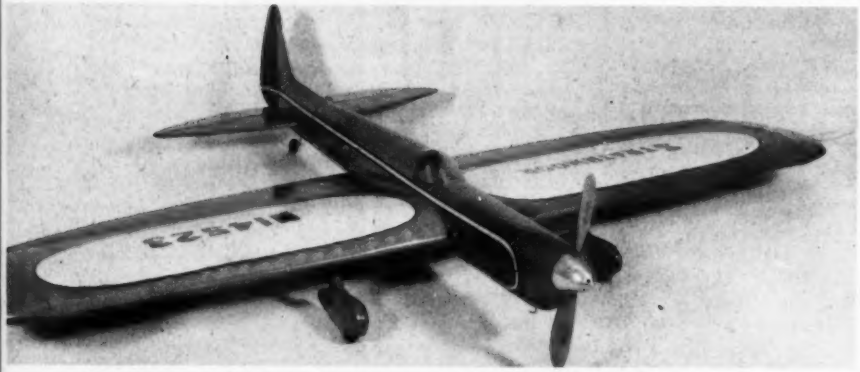

POWER
12 - 16"
RUBBER
STRANDS
900 RPM
2½" X 11"
JULY 1910
TWIN-PUSHER
3/16" SQ. ASH
FRAME
"PLANES" 1/32"
THK. WHITE
WOOD
24"
PROPS 1/8"
WHITE WOOD
STEAMED TO
SHAPE
4" X 30"
10" DIA.


SWINGING
STRUT
RUBBER
BANDS
1910
LANDING
CHASSIS
L. J. LESK
APRIL 1910
76.4 FT.
1910
OFFICIAL
LANDING
AREA
NMAC
100 FT.
45°
START
CAL SMITH
1910
JERSEY
SKEETER
NOV. 1910
50¢
1910
AS RUBBER
TWISTS AND
SHORTENS, IT
DRAWS UPON UNTWISTED
RESERVE

With helper holding the Strathmoor inverted to insure quick, clean start, author flips propeller.

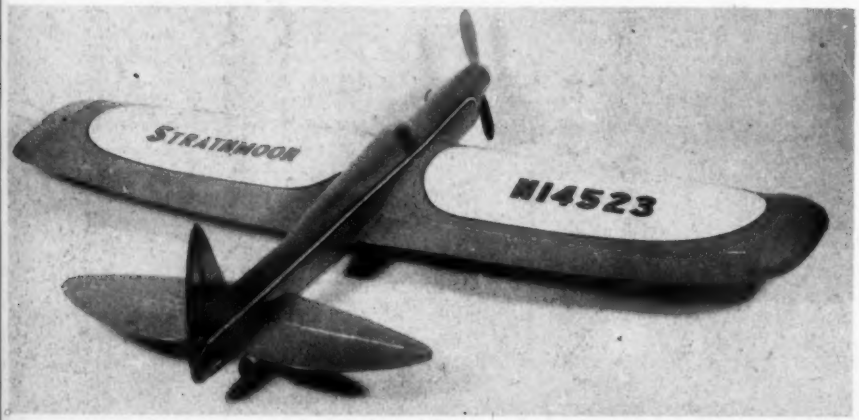
Among Detroit class models, Strathmoor itself has two seconds and a fourth at Nationals.

The "Detroit" Stunter



More wing area and a longer tail-moment arm of the Strathmoor deviate from the "classic" stunt ship flown by almost everybody in recent years. A ship that you can fly year in, year out.

The one-to-one ratio of flap to flipper movement ordinarily frowned on, but author, after Aldrich, makes set-up pay off. Racy lines plus nifty paint job and finish, please the judges.



by ROLLAND McDONALD

The Strathmoor is the most famous of the stunters in the Motor City. These aircraft took more places at the Nats than any others.

► The Strathmoor is an airplane designed to meet the needs of the contest stunt flier who is out to get those few extra appearance points which can make all the difference in today's tough competition.

Let's face it. There isn't a stunt flier in the country that is outstanding enough that he doesn't need every point he can get.

In the Strathmoor, you have an airplane which has been undergoing constant development and improvement since 1952, when I built the first of its type. In this time the Strathmoor has been a consistent winner for me, failing to take home a trophy only twice in the past seven years. Besides having held several Michigan and Indiana state championships, it has taken two seconds ('54 and '58), and a fourth ('57) in three tries at the Nationals.

As some people reading this will know, the Strathmoor is what has become widely known as a "Detroit" design. These people will also know that all "Detroiters" incorporate a novel false rib wing construction, with the main spar built as a part of the fuselage.

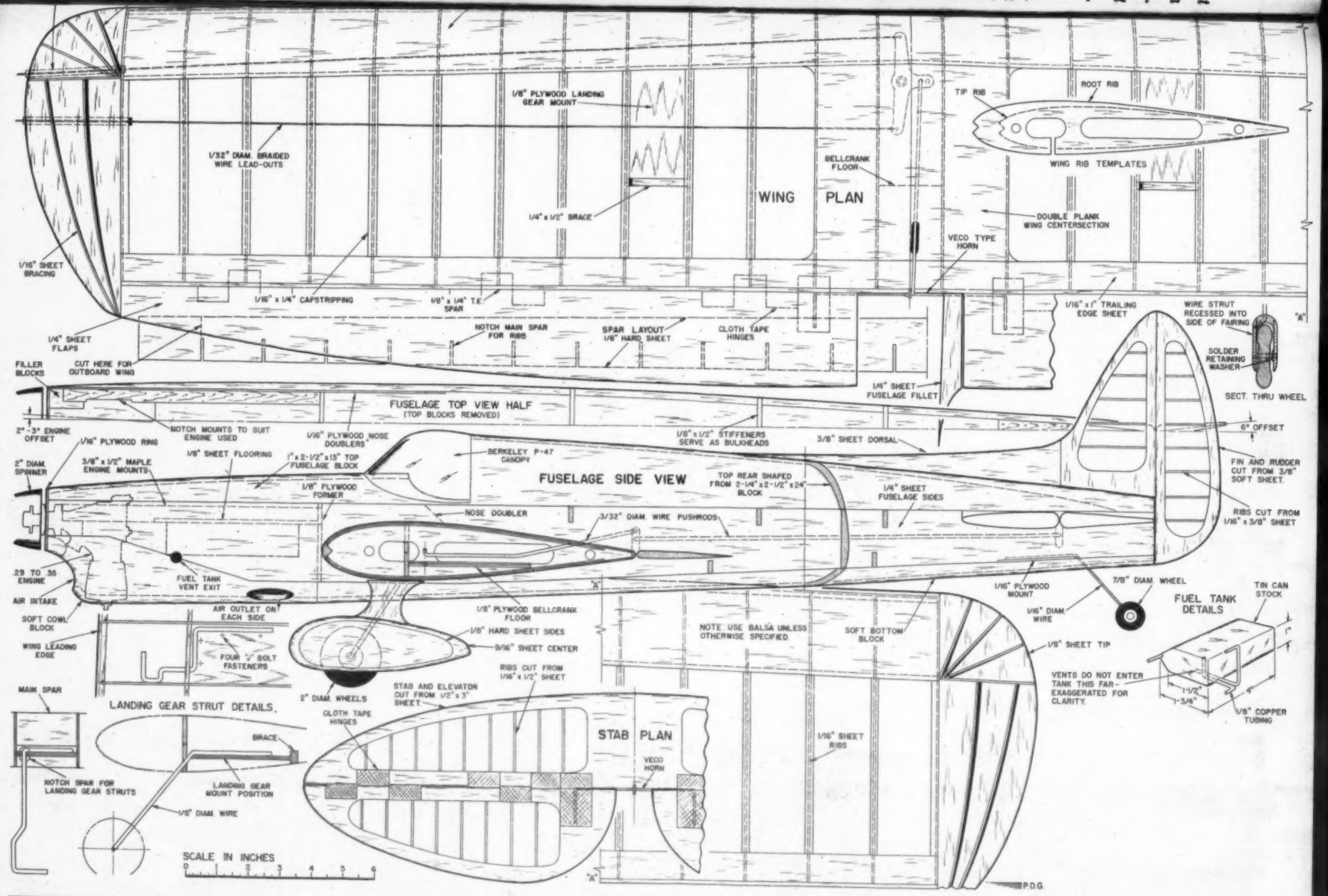
Now don't go away mad. I have changed these plans to the "Nobler" type of "D" tube wing for two very good reasons.

First, with the "D" tube wing, you can bounce the ship off the ground pretty hard and still hope to fly the ship again that day. With the "Detroit" wing, one good belly whopper and you're out of business.

Second, while this construction offers positive alignment of the wing and thrust line (this being my only reason for using it, aside from it being a bit different), it is very difficult to build unless you have calibrated eyeballs or want to build a complicated jig to avoid building in warps. I have also found that I can't seem to explain adequately this wing to a flier who has never seen one before it was covered.

This change in construction has no effect whatsoever on the performance of the airplane, as the airfoil and all other details have not been altered.

Well, down to the business of building the airplane. Since the construction of the Strathmoor is fairly conventional, I won't go (*Continued on page* 45)



FULL SIZE PLANS AVAILABLE. SEE PAGE 60.

Early Birds

by DOUGLAS ROLFE

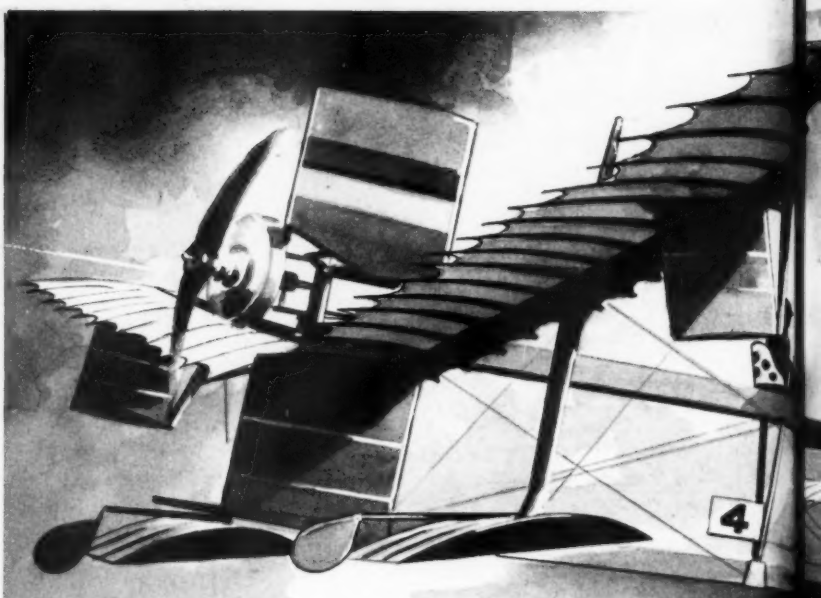
Number 4

THE FIRST SEAPLANES

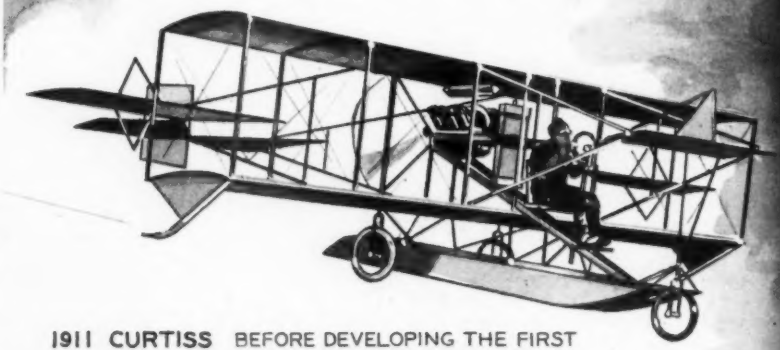
As in so many instances dealing with historic aviation the question of who was first is, in the case of seaplanes (they were called hydroplanes in those days) a controversial subject. We know that Glenn Curtiss experimented with crude pontoons on the "Loon", a group project he was associated with, before launching his own aviation company. And that the Voisin brothers conducted similar experiments at about the same time.

Henri Fabre, of France, is often credited with being first to actually make successful off-water flights but Curtiss certainly led the field from around 1911 until 1919 when the Italians took over for a number of years.

In the selected types shown on these pages, the pontoon float with its various dispositions, the central float, the first amphibians, and the first flying boats are portrayed. Until the appearance of the Curtiss boat these early "seaplanes" were, in fact, landplanes equipped with one kind of float or another. Later on we shall see the rapid development of the flying boat and encounter such important names as Short, Sikorsky, Grover Loening and Grumman, to name but a few.

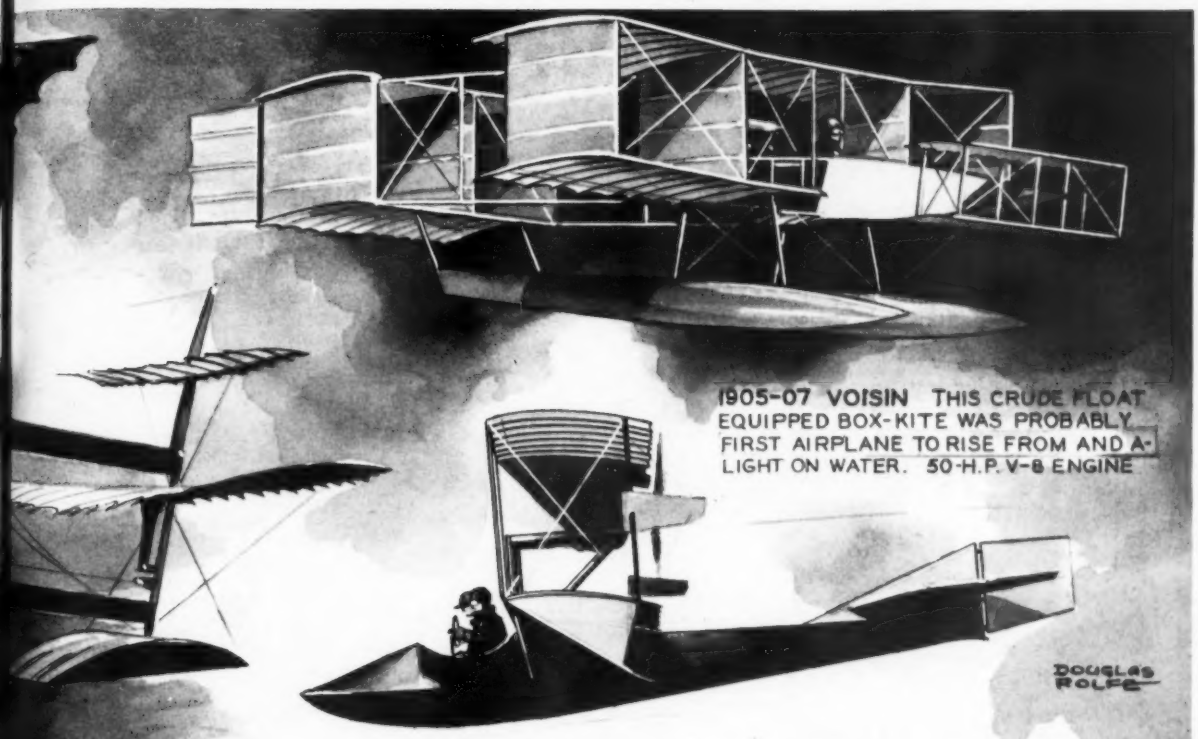


1910 HENRI FABRE - NOTED FRENCH PIONEER SEAPLANE DESIGNER, INTRODUCED AIRFOIL SECTION PONTOONS WHICH PLANED EASILY AND CONTRIBUTED TO OVERALL LIFT. NOTE THE GNOME ROTARY RADIAL ENGINE



1911 CURTISS BEFORE DEVELOPING THE FIRST REAL FLYING BOAT GLENN CURTISS HAD ALREADY INTRODUCED THE CENTRAL FLOAT WITH AMPHIBIOUS TRICYCLE LANDING GEAR. THERE WERE NUMEROUS MODIFICATIONS OF THE BASIC DESIGN.

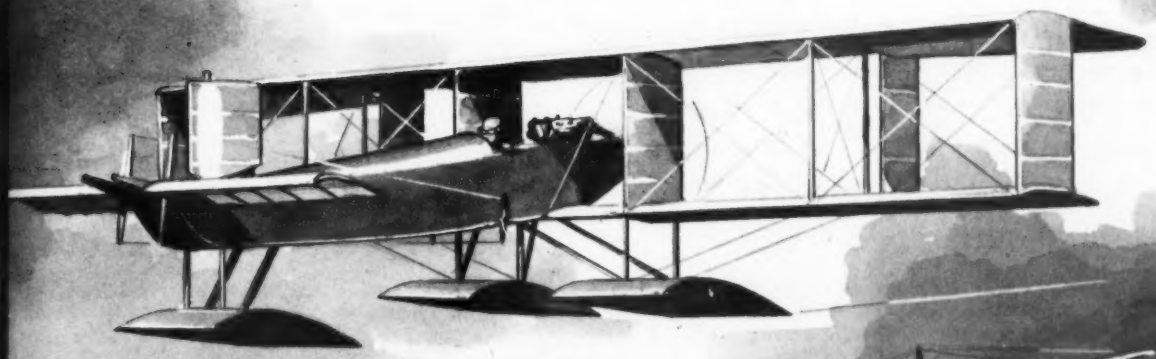
1910 GABARDINI AN EARLY ITALIAN APPROACH TO THE TRUE FLYING BOAT, THIS BOLD IMAGINATIVE DESIGN WAS UNDOUBTEDLY INSPIRATION FOR THE MUCH LATER SAVOIA-MARCHETTI BOATS-FIRST PLANES TO MASS-FLY THE ATLANTIC



1905-07 VOISIN THIS CRUDE FLOAT EQUIPPED BOX-KITE WAS PROBABLY FIRST AIRPLANE TO RISE FROM AND ALIGHT ON WATER. 50-H.P. V-8 ENGINE

DOUGLAS ROLFE

1912 CURTISS WAS FIRST AUTHENTIC FLYING BOAT. THE PROTOTYPE MODEL SHOWN HERE HAD AN UNSTEPPED HULL



910 VOISIN-FABRE FITTED WITH FABRE FLOATS THIS CURIOUS "CANARD" BIPLANE WAS DESIGNED AS A BASIC TRAINER FOR THE EMBRYO IMPERIAL RUSSIAN AIR CORPS

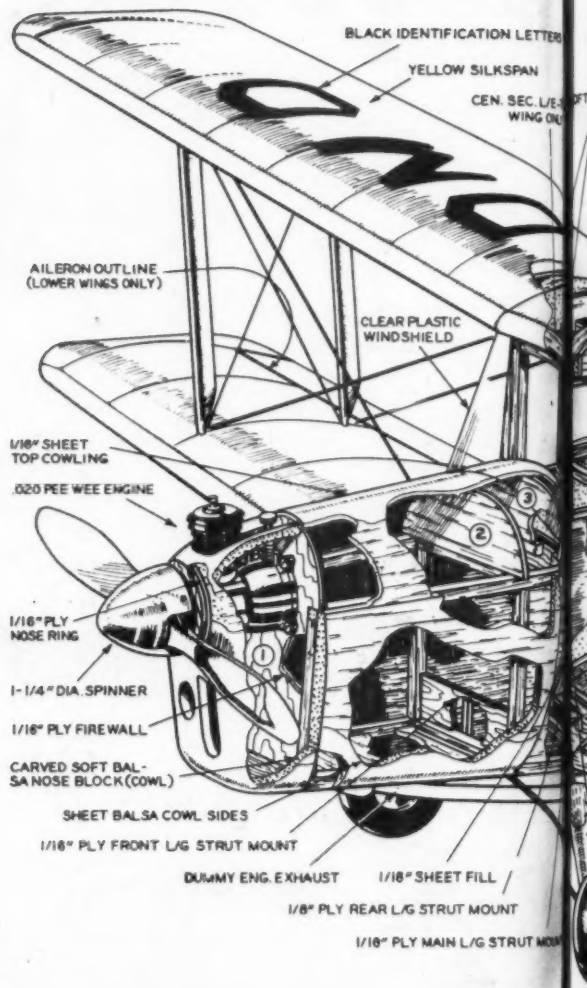
1912 HENRI FARMAN HUGE WING SPREAD, SMALL STEP-LESS FLOATS CHARACTERIZED WINNER OF WORLD'S FIRST INTERNATIONAL SEAPLANE CONTEST. WITH 50-H.P. GNOME ENGINE IT ONCE CARRIED PILOT AND THREE PASSENGERS - TWO STANDING ON FLOATS!

She'll look about like this coming in for a deadstick landing. The cabin makes easy wing mounting, alignment. No center section struts.

Hornet Moth

by H. G. BOWERS

This old DeHavilland cabin biplane was made to order for flying scale enthusiasts. Even the smallest Half A engines provide realistic flight. Different, it will be a stand-out on any flying field.

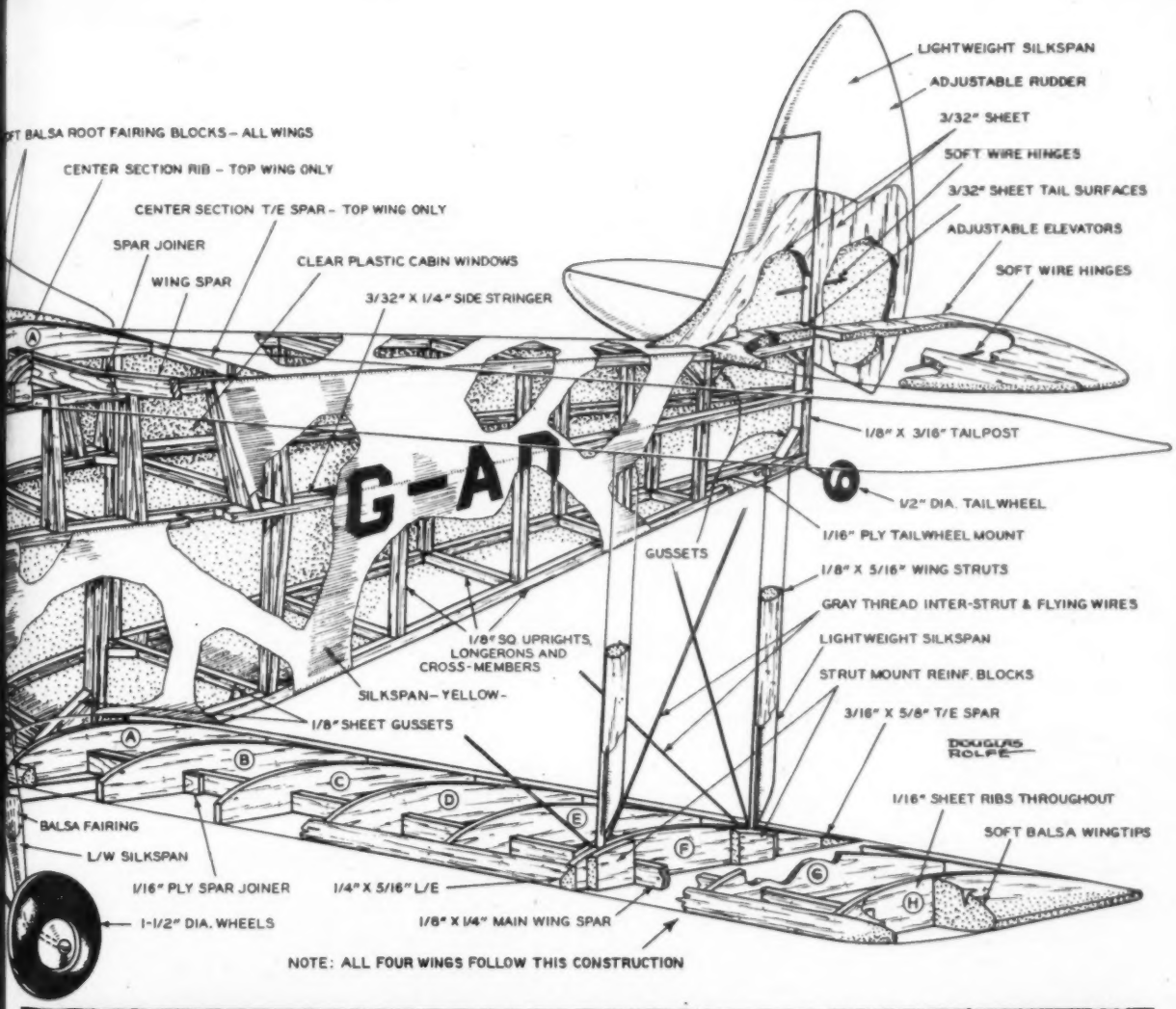


► The D. H. 84 Hornet Moth was one of the very popular "Moth" series of light aircraft produced during the 1930's by DeHavilland Aircraft of England. Other members of this famous family of fine aircraft were the Puss Moth, Tiger Moth, Leopard Moth and Fox Moth. The Hornet was closely akin to the reliable old Rapide, a light, twin-engine biplane which proved to be the "DC-3 of England," and which I have seen flying in Indo-China and Denmark as late as 1956. The snappy little two-place Hornet Moth was powered by a 130-horsepower Gipsy-Major engine and capable of a top speed of 124 mph. Clean and conservative lines make it a natural for flying-scale free-flight fans. Construction is very simple and conventional.

The model is designed around any of the small Half-A engines which have proved so popular and reliable; however, I recommend very light construction and low power such as the .020 Pee Wee. Torque problems can be reduced by utilizing a larger diameter, lower pitch propeller than would be used in controlline work and, by keeping the power to the minimum required for ROG, more stability is realized and performance is much more true to scale.

CONSTRUCTION: Study the plan carefully and start on any basic part desired. I usually build the fuselage first. Use waxed paper or soap to prevent cement from sticking to the plans and lay out the two basic sides of ⅛ inch square hard balsa. When dry, take them up from the plans and sand lightly on both sides with fine sand paper or a sanding block to remove excess cement. Join the sides at the tail post and at Station 6, then crack the longerons and join at Station 1, mounting the 1/16 inch plywood firewall at this time. This is a critical stage as correct alignment is very essential. Cement well and add the remaining cross members and gussets, which are made from ⅛ inch scrap balsa. Next, formers 2 and 3 are cut from 1/16 inch sheet and cemented into position. While these are drying, add the 3/32 inch balsa side stringers, consulting the plan to insure proper location and shape. The top cowling between Stations 1 and 4 may now be added of 1/16 inch soft sheet balsa, and the side cowl pieces added. These are cut from ⅛ inch sheet balsa, and sanded to shape as shown. One-sixteenth inch sheet is used between Stations 2 and 4, and mounted flush with longerons.

Cut the landing gear wire mount from 1/16 inch plywood and drill holes for thread binding. The main landing gear strut is made from 1/16 inch steel wire, bent to shape as shown on plan, and tightly bound and cemented to the plywood mount. When dry, place the mount in position on the fuselage and cement well. Now bend the other landing gear struts of 3/64 inch steel wire and bind and solder in position on the main strut. They are then lightly



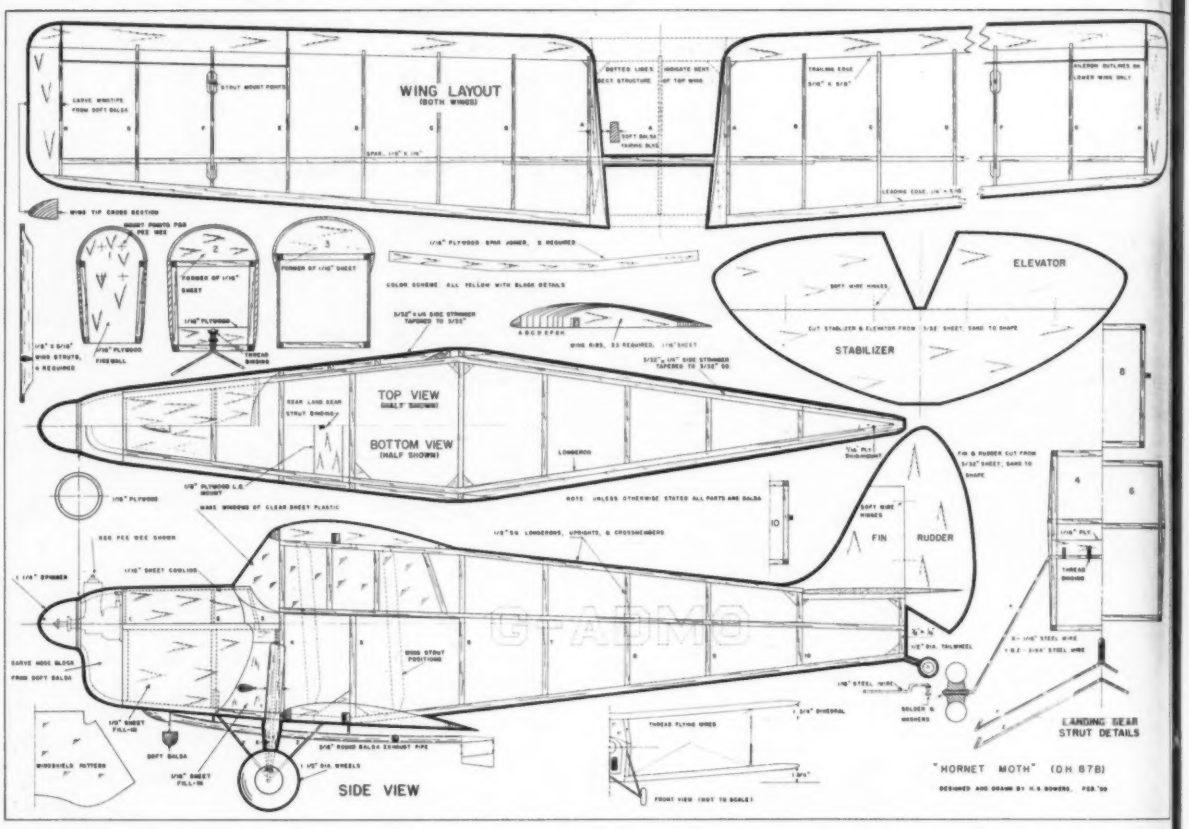
Simple, light construction, as it should be. Note, however, that the nose is sturdy. Clean cowl and sturdy landing gear functional.

bound at their apex to fuselage members with thread and cemented, as shown on the drawing. The main landing gear strut fairing is made from soft scrap balsa sheet and sanded to airfoil shape. An emery board works quite well for this. The nose cowl may now be carved from a soft balsa block. Wall thickness should not exceed ⅛ inch.

Now lay the fuselage aside and cut the tail surfaces from 3/32 inch sheet balsa. Solid surfaces are used to compensate for engine weight and reduce to a minimum the amount of balance weight required. Sand these surfaces to an airfoil shape and lay aside with the fuselage.

Wing construction is conventional and very simple. Both wings are identical except that the top surfaces are joined at the leading and trailing edges as well as at the main

FULL SIZE PLANS AVAILABLE. SEE PAGE 60.



HORNET MOTH . . . continued

spar so that they may rest flatly in position on top of the fuselage. When joining the wing surfaces, insure proper and accurate dihedral by using blocks at the wing tips until dry. Sand carefully and insure that no warps exist.

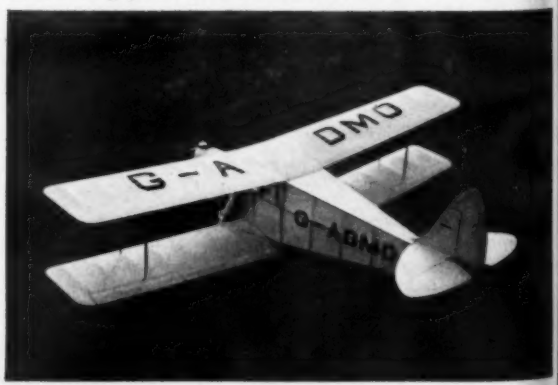
The model now is ready to be covered. Use lightweight Silkspan of the desired color and apply wet. Cover all balsa parts such as tail surfaces and cowling with Silkspan as this will insure continuity of color if pigment dope is not used. Dope the model with three coats of thin, clear, hot-fuel proof dope with several drops of castor oil added to reduce the tendency to warp. True surfaces and alignment are very essential to any free flight model.

Details are now added, such as the clear plastic windows, registration numbers, control surface inking, etc. Do not install the exhaust at this time as it will block entry to the lower wing mounting slot. The wheels and engine are now mounted, and the nose cowl lightly cemented in position if the engine is in an upright position as shown on the plans. If inverted, use dress snaps to attach the cowl.

Cut the rudder from the fin and re-attach with soft wire hinges. This may also be accomplished on the stabilizer and elevator if desired; however, it was not necessary on my model. Now cement tail surfaces in place, mount the tail wheel, and place the lower wing center section spar into the slot on the bottom of the fuselage. Insure that the bottom surface of the wing is flush with the lower fuselage longerons to give the required angle of incidence. Cement the lower wing in place and mount the top wing in the position shown on the plans and cement well, though not excessively. The wing struts, flying wires, exhaust pipe, and other final details are now added and the model balanced at one-third of the chord (*Continued on page* 53)

Takes Jap tissue, built-up construction to make these "oldies" come to life! In this shot, an inverted .049 has been installed.

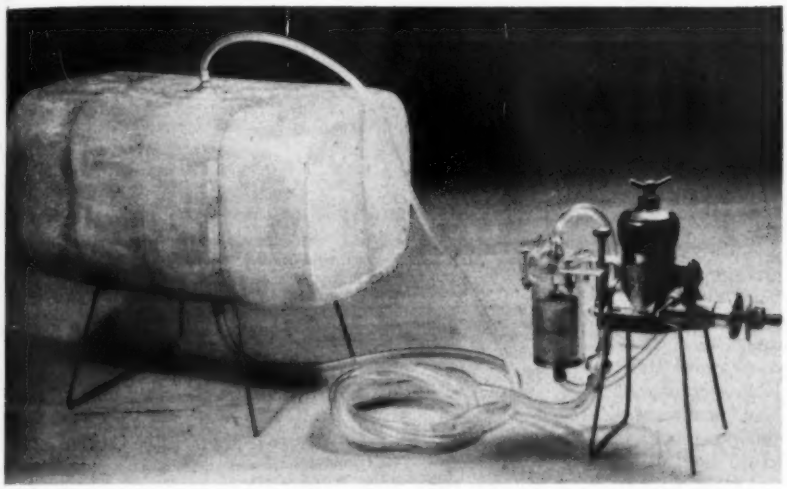
Cylinder head of tiny Pee Wee sticks up in this rear-quarter view. All four wing panels alike and tail surfaces made of sheet balsa.



The airplane would gross six pounds. Now the problem was a 12-hour minimum engine run on half this weight, including tank, engine, fuel, prop, and gadgetry. This is system that might keep an engine running from . . .

. . . dawn to dusk

. . . by Peter G. F. Chinn



Little engine, big tank! Pressurized from crankcase, system proved entirely unaffected by fuel head, ran over 13 hours on full-tank bench test without adjustment of any kind. Fibreglass tank.

Turning a 10 x 6 nylon propeller, little .09 Diesel took fully loaded model off runway in a calm after a run of 480 feet. For super duration actuator an almost overwhelming problem.

Because fuel load must be exactly on CG, pressure system essential. Sytrofoam blocks, fore, aft, of tank, effectively prevent it moving in crack-up. CG transistor r'cvr in pic.

► A project aimed at producing an RC endurance gas model that would have a potential performance trebling the then existing world record. This was the ambitious scheme that we were invited to join as engine man.

The requirements were, (a) an engine that would provide sufficient power to take off from the ground a model of, say, six pounds all-up weight; (b) a fuel system that would keep the engine running all day and (c) a total power package weight, with fuel, that would leave sufficient margin for the required radio equipment, all contained within an airframe of adequate strength.

Thanks to the ability of the other members of the team to keep down airframe and radio weight, we were able to allow ourselves 50 per cent of the all-up weight, i.e. about 3 lb, for our complete power unit of engine, fuel system and fuel. This meant that we had to aim at a fuel consumption of not more than 3.5-4.0 fluid ounces per hour, or, at a specific gravity of 0.80-0.85, about 38 oz. avoirdupois of fuel for 12 hours running, allowing a maximum of 10 oz. for engine, tank and ancillary equipment.

The first thing, obviously, was to decide on the motor to be used and, to achieve the type of performance required, it seemed that a diesel having a displacment of not more than 0.10 cu. in. would offer the best compromise. It was clear that, for the size and type of model planned, a large prop turning at moderate rpm would be preferable, aero-dynamically, and, in fact, only by holding revolutions down to 7,000 rpm or less, would it be possible to achieve the low consumption figures envisaged.

Glowplug motors, especially in the smaller displacements, are renowned neither for low speed pulling power, nor low fuel consumption. A spark ignition motor, running on a gasoline base fuel has the greatest potential for endurance work, but a slightly bigger displacement (around .13 cu. in.) would have been necessary to achieve equivalent power. No such motor was available, nor was it known how long timer points or spark plug could be expected to stand up to continuous running and, of course, there would be the additional weight of the ignition system.

Accumulated data from earlier tests on innumerable diesels in the .09 cu. in.

group, suggested two motors with which experiments should begin. The first of these was the Frog '149', a radially ported engine with rear induction via a spring loaded diaphragm valve. One of these motors had been run for 70 hours non-stop and was known to have a very low specific fuel consumption. The second possibility was the ball-bearing equipped Oliver Cub, the most powerful .09 diesel produced to date and also known to have excellent specific consumption figures. Unfortunately, the Cub was withdrawn in 1955 after only a short period of production and our sole example had been lost, but John Oliver very kindly came to the rescue by building one up specially for us. About this time, too, George Fletcher, designer of the Frog engines, was working on ways and means of improving the performance of the shaft-valve '150' type diesel and sent along a prototype for us to try out.

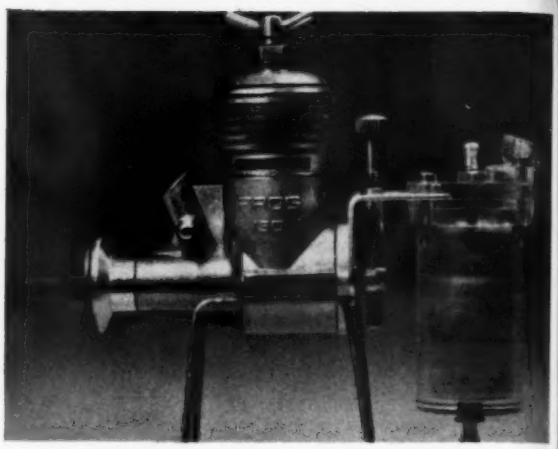
Our first step was to run a series of consumption tests on 10/4, 10/5 and 10/6 props. From these, the Frog 149 emerged as the most economical, consuming only 3.2 oz/hr on the 10/4. The modified 150 (now in production as the Frog 150-R) delivered another 500 rpm, but its consumption was up to over 4 oz/hr. As expected, the Oliver Cub was exceptional on a basis of power output (over 7500 rpm on the 10/4) but, to hold its revolutions down sufficiently to cut actual consumption to a level comparable with the 150, meant increasing pitch to 6 in. or diameter to nearly 11 in. The Cub was, in fact, too powerful for the projected model and it was decided to hold it in reserve and concentrate on the 150. We were satisfied that, with experiment, consumption on the 150 could be held to 3.5 oz/hr and if the power delivered should later prove either too little or too great for the model, we could always fall back on the Cub or 149.

The next step was to devise a fuel system. Obviously, fuel head or pressure would have to be regulated. The simplest way to get the fuel to the engine would be to pressurize the tank and then equip the engine with a pressure regulator or float valve. The tank could be of a multiple cell balloon type, sandwiched between tensioned plates on the Walker principle, or it could be pressurized by external air pressure from a reservoir, or by tapping crankcase pressure.

We decided in favor of the latter device, but to use a low pressure system worked simply by the positive pressure created by compression and depression differential within the case and without any form of non-return valve. In a previous experiment we had encountered some difficulty in controlling the very high pressure resulting from a rotary-valve timed system utilizing crankcase compression only. With this latter arrangement, a very finely metered outlet is necessary to avoid excessive fuel pressure from the tank and since the pressure is one way only, the tiniest speck of matter in the outlet jet from the engine can cause a stoppage.

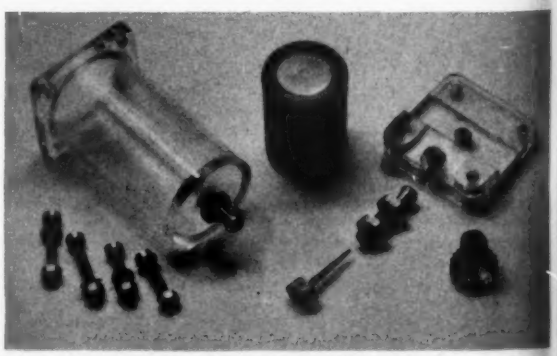
The same line of reasoning dictated our choice of a float chamber rather than a Walker type regulator. Ken Willard has since shown, by his fine world record flight, that the Walker regulator can work for many hours without trouble, but the knowledge that a float chamber would continue to supply fuel for several minutes if anything temporarily interrupted the pressure, seemed to be an important point in its favor.

Our next problem was the tank. It would have to be baffled to prevent fuel surge upsetting model trim and would have to be strong and light. The easiest to make would be a soldered metal tank, but it would be heavy. A 48 fl. oz., rectangular section polythene picnic bottle was obtained. This weighed 5 oz. (say 6 oz. with neck cut off and baffles and connections added) and seemed fine, but for the difficulty of successfully cementing the joints. We therefore decided on fiberglass.



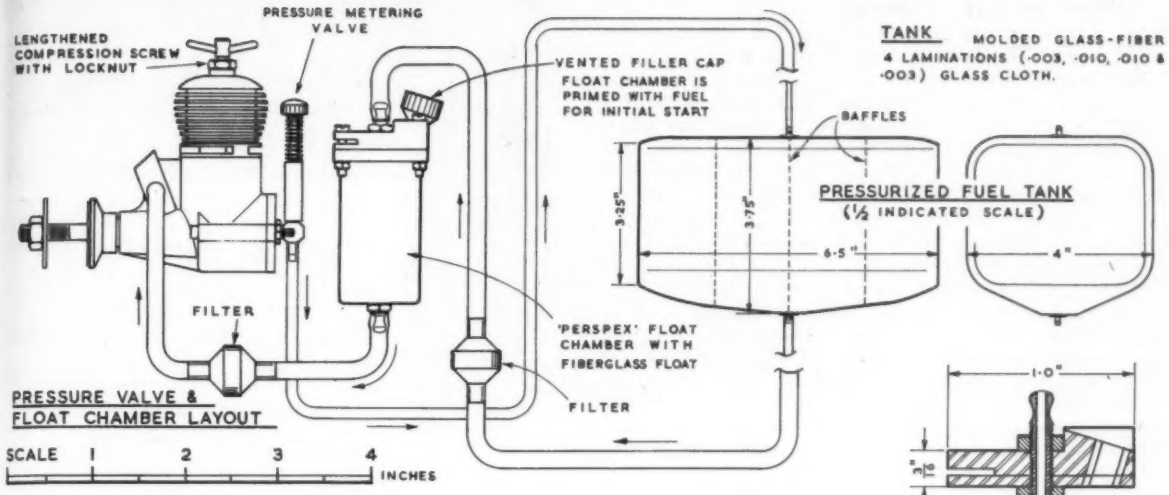
Complete engine and float chamber assembly. Diesel .09 chosen for modest fuel consumption and ability to turn a 10-inch propeller.

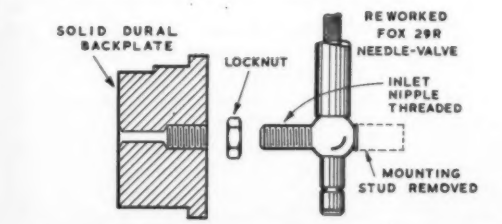
Reworked Diesel had new backplate, modified Fox 29R needle to meter case pressure and a safety nut to lock compression setting.



Float chamber parts. Bowl was turned from clear acetate. Molded fiberglass float weighed 1/25 oz. Run on chamber alone 3 minutes.

Before the various components were made, some preliminary experiments were carried out. It was, for example, determined that the engine would run quite happily by direct pressurization, i.e., by pressurizing the tank via crankcase pressure and leading the fuel delivery tube direct to the carburetor. The delivery pressure was so constant that the engine would empty a 3½-in. deep tank, but, of course, any serious alteration in fuel head, such as might be caused by a steep climb (*Continued on page 49*)



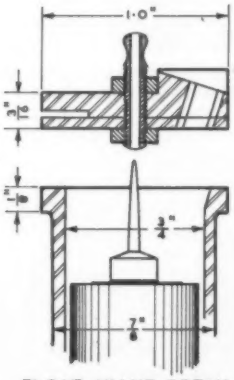


BACKPLATE & METERING VALVE DETAIL
(2X INDICATED SCALE)

FLOAT MOLDED GLASS-FIBER
2 LAMINATIONS .003" GLASS TAPE
DIMENSIONS: 11/16" DIA. X 1·0"
WEIGHT: 0·04 OZ.
NEEDLE WEIGHT: 0·035 OZ.
MAXIMUM FLOAT DISPLACEMENT, AT SP. GR. OF 0·80–·085 = 0·16 OZ.

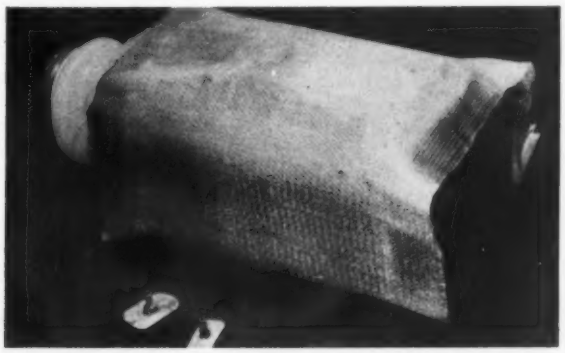
WEIGHTS:

	OZ.
ENGINE & METERING VALVE ASSY.	3·65
FLOAT CHAMBER COMPLETE	0·75
FUEL TANK	4·90
TOTAL	9.30



FLOAT VALVE DETAIL
(2X INDICATED SCALE)

Fibreglass tank was molded around 48-ounce capacity plastic bottle with clay added (on top, here) to provide a last-drop sump.



Four layers of glass cloth used to mold tank. Inlet and outlet connections soldered to wide-flanges afterwards were molded in.

Ends, baffles. Resin and cloth laid on glass, covered with acetate sheet, bubbles rolled out.

Baffles cut from flat sheet laminate. Strips inside, resin cemented, located baffle positions.

Ends butt jointed, trimmed, joints reinforced fibreglass tape. Tank, 1/3 gal., weighs 3 ozs.

The "old fashioned" free wheeler superior to the folders, claims the author, who reopens an old argument. Other interesting features include geodetic construction, skid-type landing gear.

The Bardon

by DON MACKENZIE

Winner of the '56 Canadian Nats, American '57 Nats, a dependable Wakefield—from above the border.

The 50-gram rubber motor, permitted by rules, is made up of 12 strands 3/16 rubber, taut between hooks. Safe 600 turns gives 50-second motor run. Jap tissue, 3 coats—half and half.

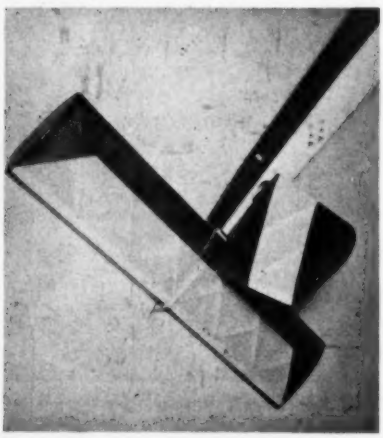
► Which is better, the free-wheeling or folding propeller? This question has given rise to many arguments over the past years and no clear-cut decision will ever be reached. Both types of propellers have their advantages and disadvantages. In the search for a dependable prop for rubber flying, and after having tried single- and double-bladed folders, it was found that the free-wheeler offered dependability, consistency, reliability, ease of construction, and a climb not matched by a folder. Admittedly the folder has a superior glide, but a model which climbs higher has a far greater chance of picking up lift.

The Bardon was developed from designs originated by Barry Haisman. He and the author worked out this present design to the old 80 gram rubber weight, and now with only 50 grams to play with, the tried and tested Bardon is a good bet for top honors every time. The model is functional, stable, and has won more than its share of contests, such as the Canadian Nationals in 1956, the 1956 New England Wakefield Group challenge match, and more recently the Wakefield event at the 1957 American Nats. It was also flown proxy at the Wakefield finals in Sweden in 1956.

Wing and Stab: Construction is straightforward. Remember that this wing is not "poly" and employs "V" dihedral at ten degrees. Use 1/32" ply dihedral braces on the leading edge, main, and bottom spars. Keep the stabilizer as light as possible, selecting wood with care.

Rudder: The rudder should be kept as light as possible. The outline can be built in the bench, but ribs and spars have to be added after the outline is lifted off the plan. The 1/16" bamboo peg and needle are added next. Position the peg exactly as shown on the plan, since its proper location will assure a secure tight fit.

Geodetic construction, also used on fin, stabilizer, for rigidity and prevention of warps.



The one-piece propeller carved from balsa that weighs 6-7 lbs. per cu. ft. Gives more climb.

Fuselage: Cut out the two fuselage sides. Cement 1/16" square longerons to the side edges and add ⅛ by 1/16" uprights, notching them to let in the longerons. Add strengtheners at nose and rear peg. Join the sides together in the normal manner using temporary spacers. Start sheeting top and bottom, making sure that the grain runs 45 degrees to the sides. Add soft ¼" square rudder peg receptacle, making sure that the hole is a snug fit. If it should loosen up under use, pour a little dope into the hole, work the peg up and down, and it will swell sufficiently to give a nice snug fit.

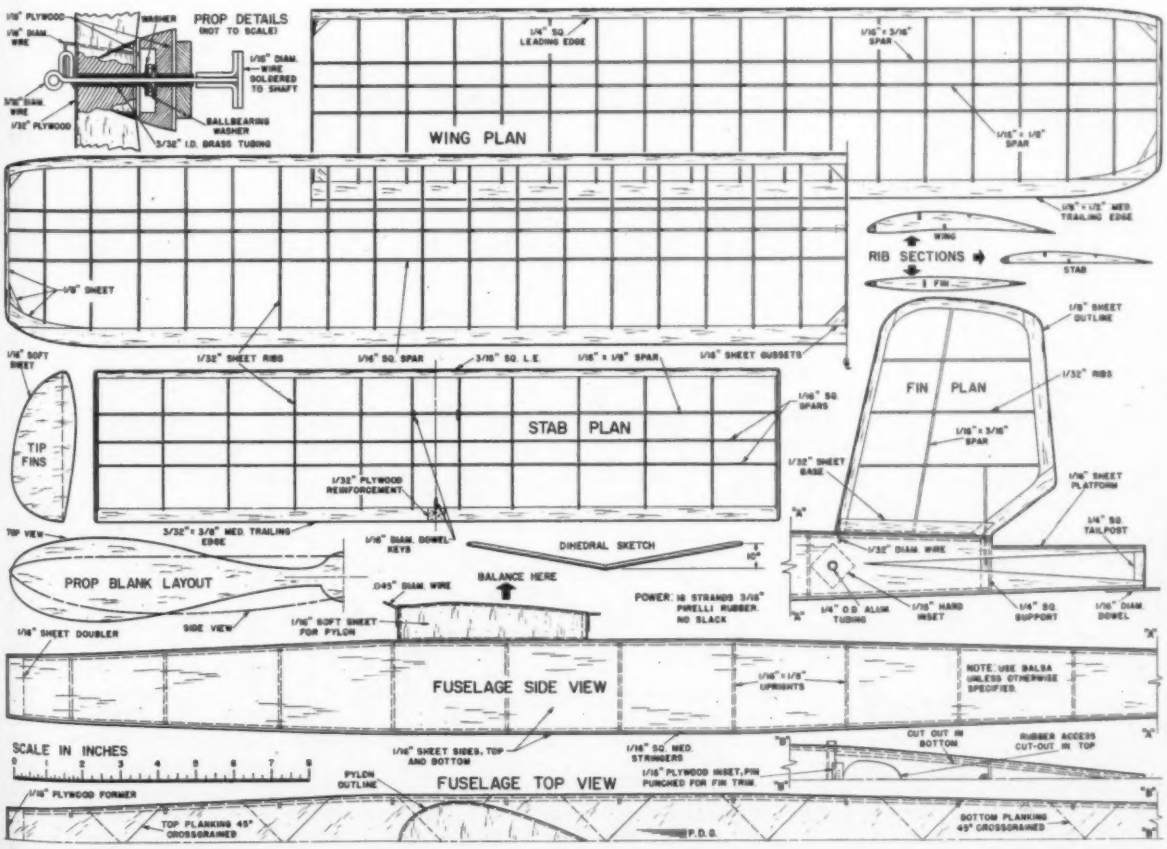
Pylon: The bottom is in one piece and the top in two. The two top pieces are cemented together using the completed wing to get the proper dihedral angle. When this is dry, cut out the center upright. Add to this upright the bottom and top pieces. Make sure that everything is square, and allow to dry. Add the sheet vertical sides, and hooks. Do not cement the pylon to the fuselage right away. It can be temporarily located for the best flying position and secured permanently later.

Propeller: Select a good piece of clear straight grain wood about six to seven pounds per cubic foot. Rough out the blank to the outlines as shown on the plan, and carve to shape. Maximum undercamber should be no more than 3/32". Use no less than 2mm (about .08) piano wire for the shaft, since 1/16" is prone to bending even under normal landings. Bend the winding loop first. Make certain that it is centered on the shaft and then the clutch loop. Slide the finished prop on and wrap two turns of cotton sewing thread on the shaft behind the prop. Slide on a ⅛" piece of 2mm tubing, and sweat solder securely to the shaft. The thread prevents the solder from flowing into the tubing in the prop. Next, clean the shaft of residue solder, slide on the ball bearing washer, then the noseblock, and bend a hook of your choice.

Covering: Jap tissue or lightweight Silkspan is used throughout, with three coats of 50/50 dope.

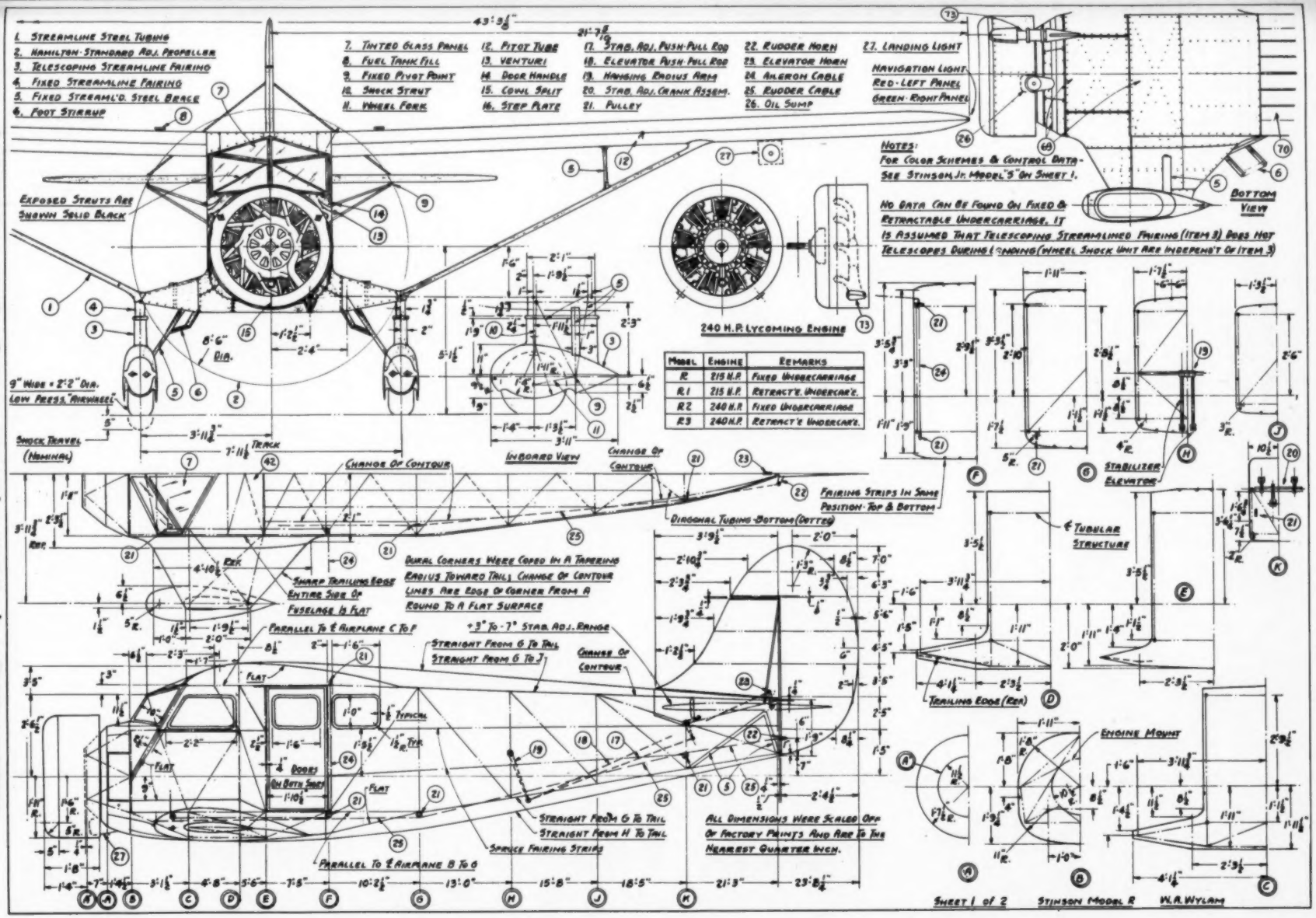
Trimming and Flying: When model is completed, install rubber. Position pylon on fuselage until model balances at point (*Continued on page* 61)

When a model must make five official flights, as in Wakefield, consistency is all important. The sure-fire performance of the Bardon makes it contender. Early design, Barry Haisman.



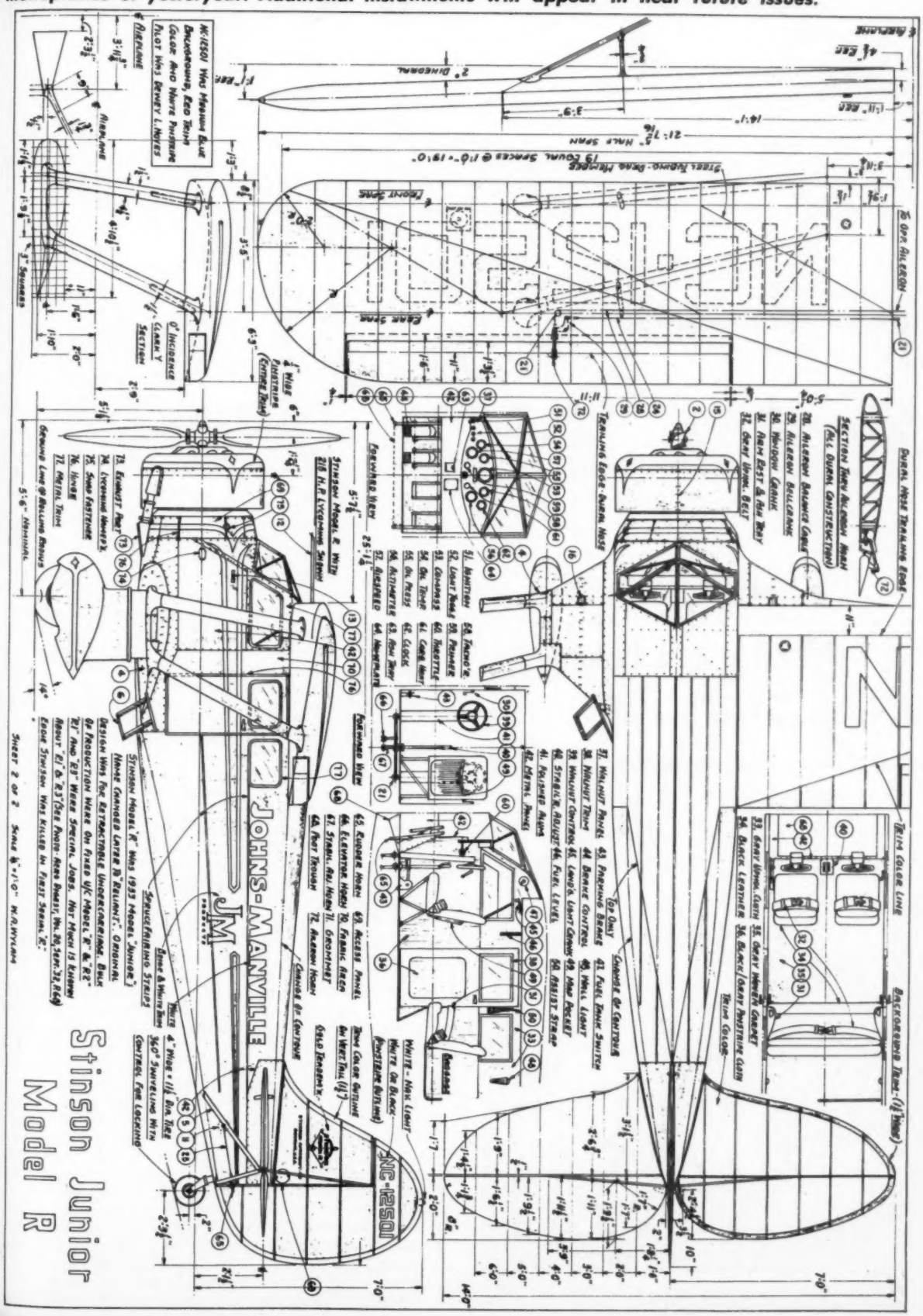
FULL SIZE PLANS AVAILABLE. SEE PAGE 60.

STINSON MODEL R by William Wylam. Continuing a great series of these famous cabin



Model	Engine	Remarks
R	215 H.P.	Fixed Undercarriage
R1	215 H.P.	Retract'e. Undercar'e.
R2	240 H.P.	Fixed Undercarriage
R3	240 H.P.	Retract'e Undercar'e.

monoplanes of yesteryear. Additional installments will appear in near future issues.

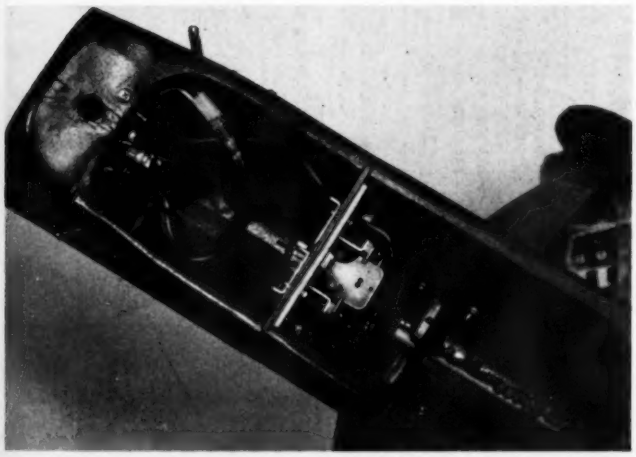


Jet-clean fuselage on R6B design by New Zealand's Allan Rowe, highly pleased the authors. Royalite is heated in oven at 300 degrees.

marvel of Royalite

by EV SCHOENBERG and JERRY DENEAU

Tired of slabsiders, intricate glued-together sticks? For slick RC jobs, scale ships, and ukie models, here's way to escape from the box-kite era.



Inside of finished shell is not cluttered by bulkheads and braces. Material combines the elasticity of rubber, rigidity of plastic.

► The possibilities of a revolutionary new medium for construction of model airplanes came to the authors' attention when, as members of the Cessna Model Club, a talk was given by Morris Reep on methods of making custom models.

Reep, an engineer with Cessna, pioneered this medium. So great was the demand for his beautiful scale display models that he formed "Reeco Custom Models." His customers now include, among others, Cessna aircraft distributors, corporations, and pilot-owners.

We are convinced that we have encountered the answer to every RC'ers subconscious desire to some day build a sleek, streamlined, super finished, dazzler! This answer is Royalite.

While the writers are primarily interested in RC Royalite uses, it is by no means restricted to RC models alone. Scale, stunt, and various U-control models would be ideally suited for its use. Also cowlings, wheel pants, and landing gear legs have been successfully formed of Royalite. RC boats and free-flight scale also could benefit from its use. The sky's the limit on what applications it can have in model building.

In this new material, the elasticity of rubber and the rigidity of plastic are wedded to achieve toughness, impact strength, and beauty. On our test model six nasty crackups due to extreme turbulence (it is windy in Kansas), pilot error, and a transmitter failure have proved Royalite capable of withstanding repeated crashes with little damage. A dented nose cone, easily replaced, is all that happened to our Royalite fuselage. We are now considering ways and means of forming a Royalite leading edge in a "C" section form to absorb the beating RC wings have to take.

Royalite is manufactured by the United States Rubber Co., and is used extensively at Cessna Aircraft Co., here in Wichita, on non stressed parts requiring compound curves and beauty, as in instrument panels, dome light consoles, window mouldings, elevator and rudder tips, and dorsal fin fairings. It is also used by other aircraft manufacturers, and thermo setting plastic firms as well.

Royalite is sold by U. S. Rubber Company, 2638 North Pulaski Road, Chicago 39, Ill.; Mr. Hub Owen handles Royalite sales. A secondary course is SERCO Imports, 811 Whittier, Wichita, Kan., offering Royalite sheets, 17" x 66" of 1/16" thickness with a very smooth finish on one

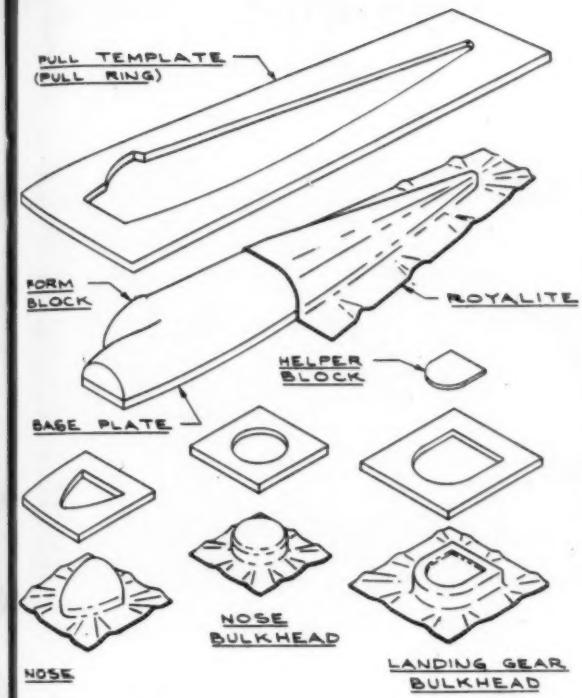


FIG. 2 FORMING OPERATIONS

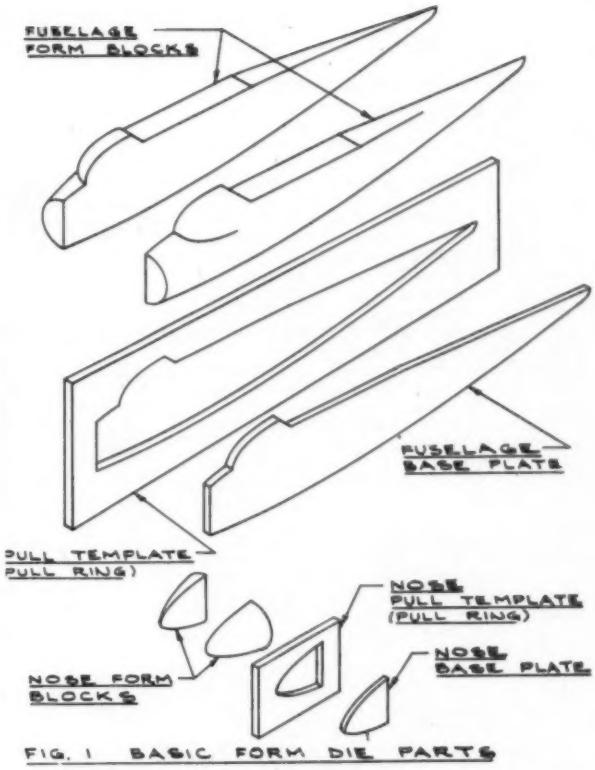


FIG. 1 BASIC FORM DIE PARTS

side, at $1.00 a sheet. SERCO Imports plan to offer a kit of two sheets, a bottle of Testors plastic cement and two tubes of Hysol cement for $4.50, F.O.B. Wichita, which will be sufficient for two smaller radio controlled fuselages or one larger one. A similar material is called Nytron 376, Charles Crowl Company, 1167 McBean Drive, El Monte, Calif. The Nytron 376 is more expensive than Royalite, selling for $.65 a square foot. The Royalite from the factory in Chicago would sell for around $.50 to $.60 a square foot. The Royalite provided by SERCO Imports would sell for roughly $.20 a square foot. SERCO Imports, has 180 sheets of the 66" x 17" size so that people can pull their fuselages in two pieces instead of the four pieces as is described in the article. After this supply of larger sheets is exhausted, the small size sheets will be available at a comparable price of $.20 a foot. The largest expense is the Hysol cement which, unfortunately, retails at $2.00 for the two tubes needed. Our fuselage cost about $.80, plus $2.25 for cement, of which we still have enough to make several more planes.

The material most suitable for RC is 2000 Series Royalite, consisting of 30% rubber and 70% resin, 1/16 inches thick (3/64 inch thick Royalite if available, would also be satisfactory). It weighs 75 lbs/cu. ft.—about six times as heavy as balsa. A 1/16 inch thick Royalite is equal in weight to ⅜ inch balsa and therefore can be used in RC for fuselages with but little weight penalty. Our pilot Royalite model of 450 sq. inches, with 17-ounce radio equipment, weighed three pounds and ten ounces, an entirely acceptable weight for the area.

This fascinating new material is full of good modeling qualities; being nonmagnetic, non conductive, grease resistant, easily formed, and easily worked, impact resistant, and easily finished. It is also ideal for mass or multiple model construction from one form. It can be cut, drilled, routed, sanded, filed, and (*Continued on next page*)

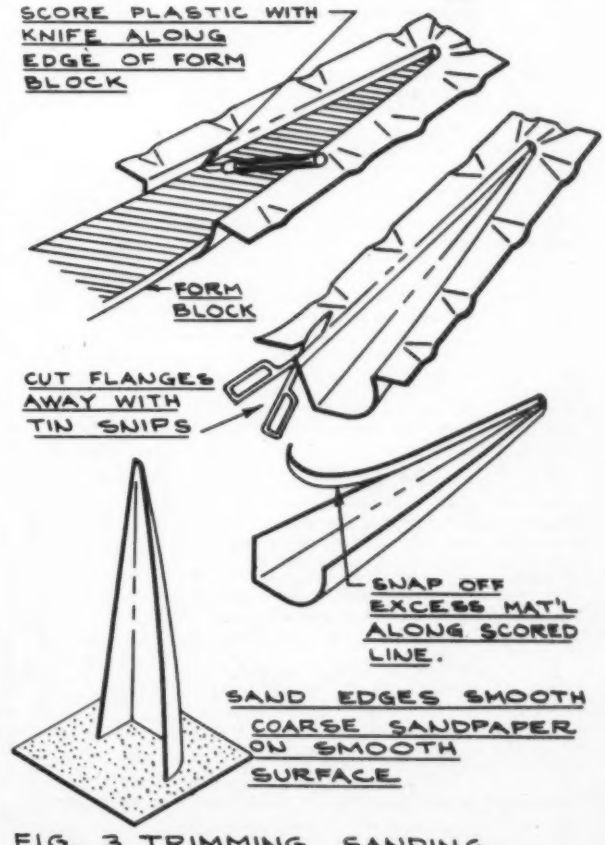


FIG. 3 TRIMMING SANDING

continued **marvel of Royalite**

cemented to wood, metal or to itself. However, it does have qualities on the other side of the ledger. It is heavy; not entirely hot fuel proof, and it needs special slow drying cements.

In large scale aircraft, Royalite is formed over molds by vacuum after the material is heated to about 300 degrees. For modeling methods, however, heating the plastic in the kitchen stove, and stretch forming it over easily made wood forms is perfectly satisfactory.

For our experimental model we chose the New Zealand R6B, designed by Allan Rowe, and our illustrations show our modifications to the basic design, as necessitated by the new construction methods used with Royalite.

Our fuselage is wholly, of Royalite except for motor mounts. The average conventional fuselage is very complicated, consisting of a maze of balsa strips, sheets, bulkheads, ply reinforcements, gobs of cement, bolts, washers, nuts, etc. In many instances this structure, which closely resembles the Eiffle Tower, is covered with yards of silk and buckets of dope. Royalite, on the other hand, allows us to make a smooth, sleek, streamlined shell of a fuselage uncluttered with bulkheads and gussets. The new concepts of thought opened up by this material will revise one's old ways of building RC models. Royalite fuselages now should be chosen for their graceful, curving lines, sleekness, and streamlined shapes, so as to give maximum strength to the material. Slab sided clunkers are out!

The first step in making a Royalite fuselage is to make your form blocks. These blocks consist of the fuselage carved out of a soft hardwood like pine, cedar, or redwood. The fuselage should be carved so that you end up with two halves. After the form blocks are finished, coat them liberally with paste wax. This permits the Royalite to slide over the blocks easier during the forming operation.

Constructing your form blocks is quite easy if you use a few basic hand tools like a draw knife, wood rasp, coping saw, etc. Of course, power tools make the job easier but are not necessary.

Once you have the two halves formed, you need to make a "forming template." This consists of a one inch thick board which has a profile of your fuselage cut out of it. This profile should be 1/16 inches larger on all sides than the fuselage blocks. If you go a little oversize, it isn't too critical. However, if you go undersize, you will split your "forming template" when you try to form your parts. This we learned the hard way.

Save the piece you cut out of your "forming template", for you will use this as a base plate for each of your form blocks during the forming operations. The base plate should be filed down so that it is a little smaller than your form blocks. A wood rasp is ideal in this respect.

In the case of our model, we formed the nose cone separately so that we would have a flat bulkhead to attach our torsion bar type nose gear.

The second step in making your fuselage is the forming of the plastic parts. One-sixteenth inch thick Royalite was chosen for our model since it would give us plenty of stiffness, making bulkheads unnecessary except to mount the landing gear.

It would greatly simplify your fuselage construction if you would obtain sheets of

(*Continued on page* 58)

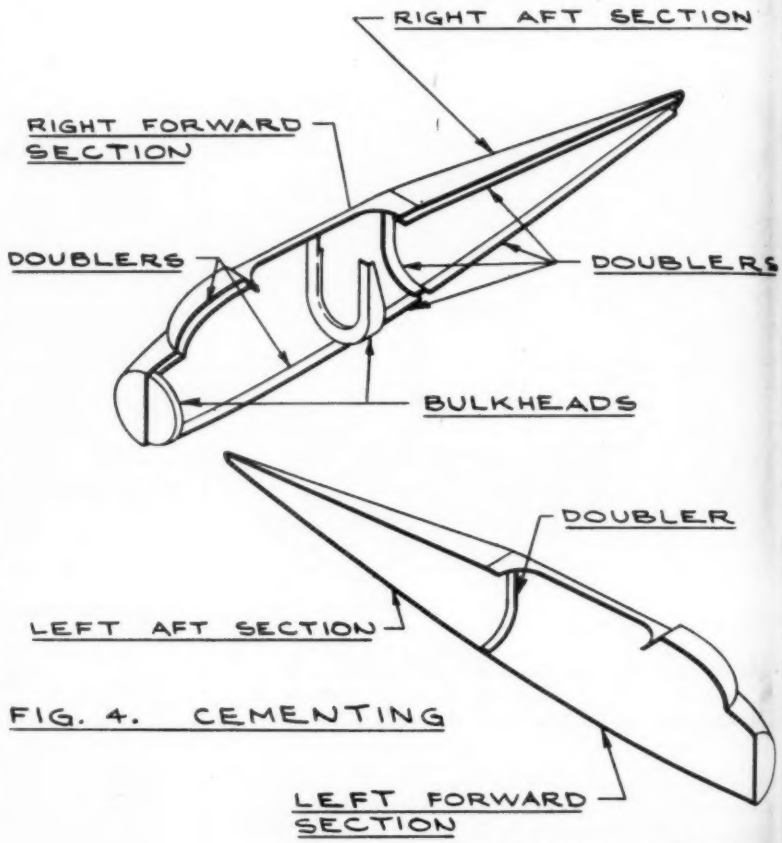


FIG. 4. CEMENTING

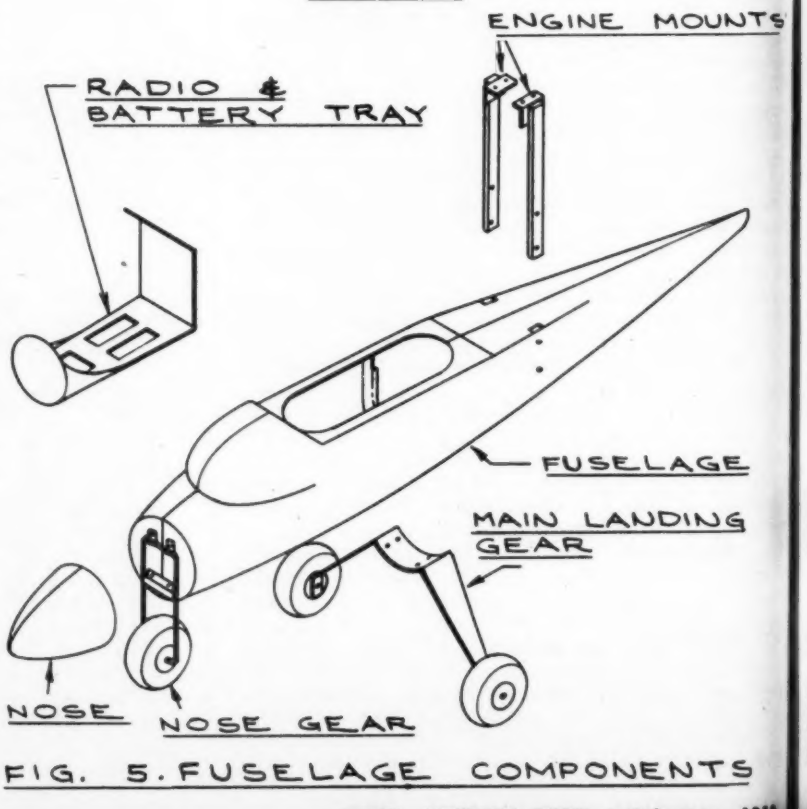
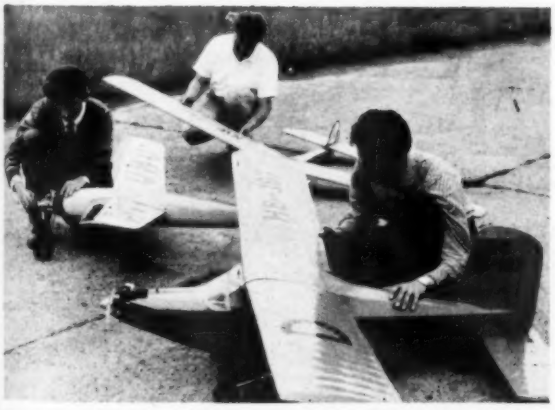


FIG. 5. FUSELAGE COMPONENTS

radio

Speed merchant Dean Zongker, Wichita, knocked off 117 mph on the downwind lap with this Dooling .61 powered job—under FAI rules.

control



Three RC models, one a glider, at West German Model Plane Championships last summer. Costs to $700 mentioned. Wide World photo.

news

by **EDWARD J. LORENZ**

Latest razzle-dazzle roundup, proves RC has come a long way from the days of baking stubborn gas tubes in stove ovens.

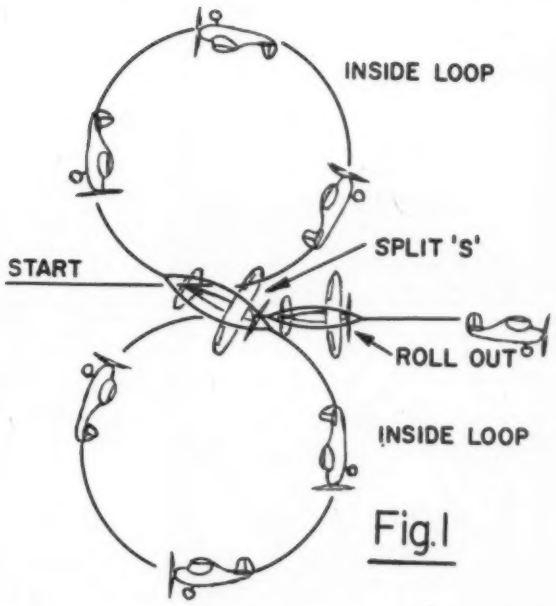


Fig.1

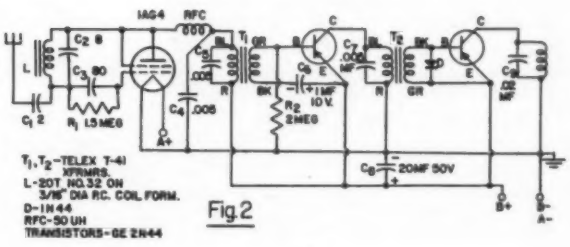


Fig.2

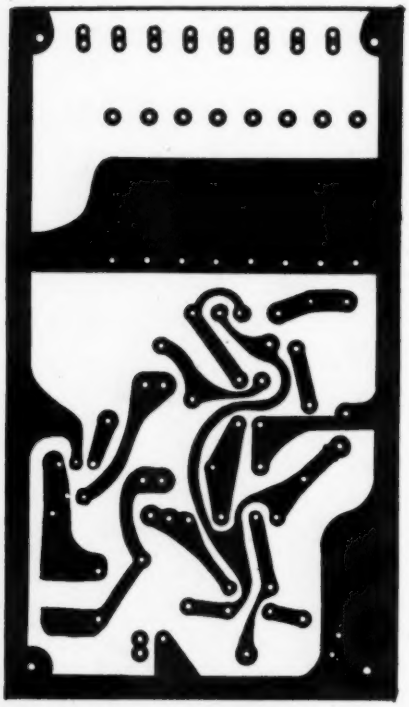
TECHNICAL TOPICS

► Distressed about interpretations of the new FCC rules in various club papers. First, any 27.255mc transmitter in operation on or before September 1, 1958 can continue to use the old frequency tolerance of .04%. You do not have to buy closer tolerance crystals for these transmitters until June 15, 1963. Transmitters built and put into operation after September 1st, must use crystals with a tolerance of .01% when the input power to the final stage is three watts or less; for full five watts input, to the final stage of an MOPA type, or to the oscillator itself in a single-stage unit, the tolerance is .005%.

Incidentally, the frequency tolerance applies to the output signal and not just to the oscillator or to the figure stamped on the crystal can. The majority of the larger manufacturers of RC equipment in the country now state that their transmitters contain the .005% crystal and the circuits will maintain this tolerance.

What are the effects of high-powered traffic light signals on RC receivers? Mr. Fred Stong of CG Electronics has made calculations that show the following: Assuming a transmitted power of 250 watts on 27.255mc, a receiver could not be tuned beyond 26.725mc and still get reasonable sensitivity with a transmitter at 26.995mc. Even here, the 27.255mc traffic light transmitter could not be within 100 miles before serious interference occurred. However, this is a 'paper' calculation and such detuning of the receiver could be fatal if there was any drift in the receiver. More figures were presented but it is apparent that anyone flying within the 100 mile limit could be in trouble.

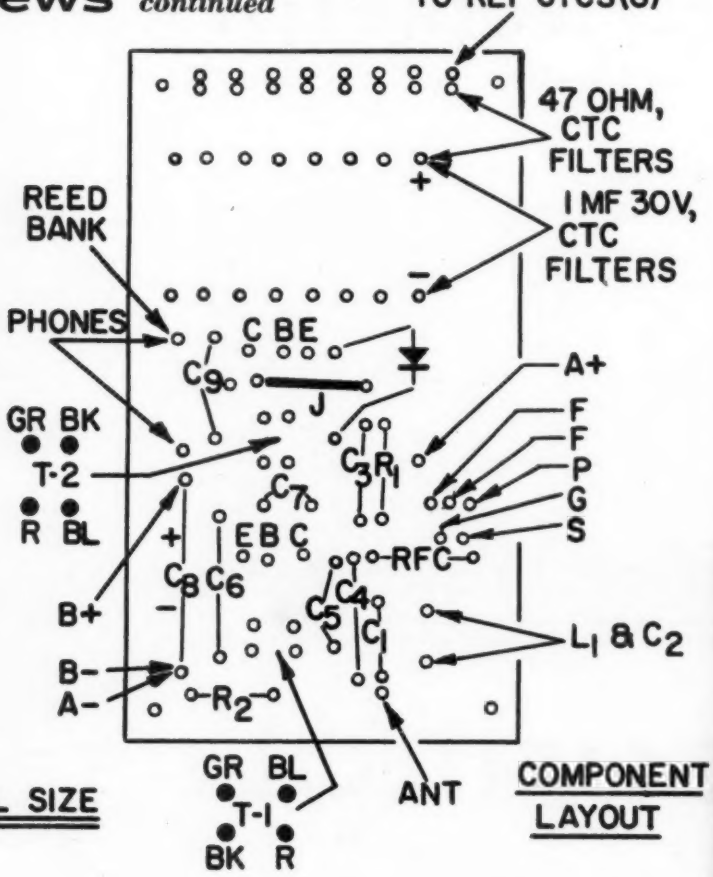
(Continued on next page)



ETCHING PATTERN

FULL SIZE

Fig. 3



On the other hand, do not assume that a traffic light signal well in excess of 100 miles will not give trouble. The ground wave is fairly rapid attenuation at 27mc but the skip distance for a good signal to your receiver can range from about 400 miles to 3,000 miles. We recently picked up hams in Dallas and Wichita on a bench setup consisting of a single tube detector operating from a 15v plate supply. The signal was strong enough to give considerable fluctuation in the following stages.

• • •

The DCRC Newsletter reports that the Bureau of Aeronautics has stated that death can result from inhaling chlorine compound fumes resulting from heating Teflon above 400 degrees F. RC builders sometimes use Teflon insulated wire or spaghetti in their work, and since soldering iron temperatures can go up to about 700 degrees, this fact should be taken seriously. It was also stated that extreme caution should be exercised to remove any Teflon ships, particles or dust from hands and clothing before smoking.

• • •

Figs. 2 and 3 show the circuit schematic and printed wiring pattern for a reed (*Continued on page* 34)

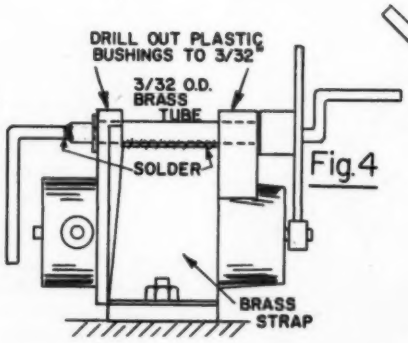


Fig. 4

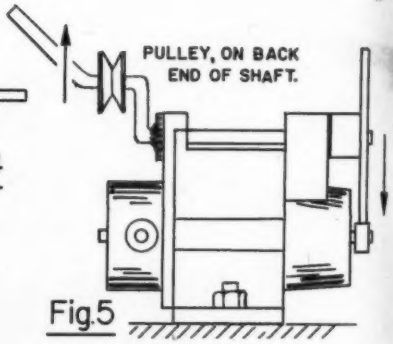
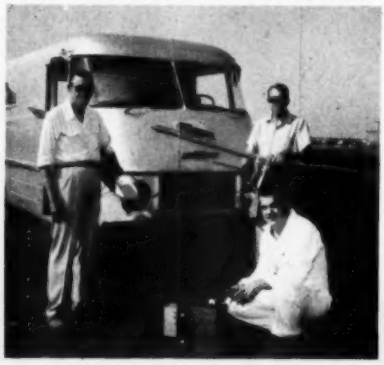
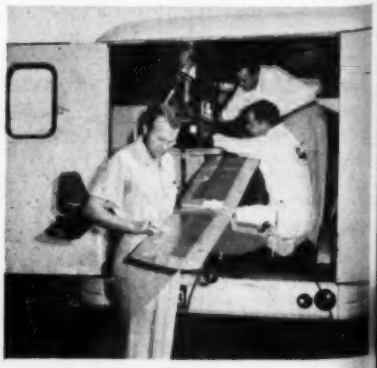


Fig. 5

RC workshop on wheels was set up by Temco Aircraft, Dallas, Southwestern Championships.



And truck put to good use during meet. A loudspeaker system with attendant, thanks to Temco.



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LOOK FOR THE SQUARE BOTTLE

THE TESTOR CORPORATION, ROCKFORD, ILLINOIS

Radio Control News

(*Continued from page* 30)

receiver as developed by the Toronto RC Model Club (Mr. A. G. Roberts, Sec., 55 Castle Frank Road, Toronto 5, Ontario, Can.). As we have stated before, such circuit drawings and descriptions do not constitute a construction article. This particular reed receiver is given for those who want a good working unit which can be constructed with etched wiring techniques. We built the circuit and the operation was very good. This may well be the last of the reed receivers presented by MAN, due to the influence of super-het and simultaneous proportional circuits.

The etched wiring chassis is given full size and the nomenclature drawing shows the placement of components. The electronic circuit is placed on the printed chassis and the reed bank and secondary relays are placed on a separate chassis, which may be a piece of linen/phenolic stock 1/16" to 3/32" thick. Short spacers may be used at the corners to separate the two chassis which are held together by 4-40 machine screws. We had good results with our unit by using the 6007 tube and a Hivac XFY-34 in place of the 1AG4. Either of these tubes would greatly reduce the filament current. The DL-66 tube might also be tried. This is a 15ma tube. Do not use over 30v on the B supply. If the etched wiring version is made, 1/16" epoxy glass is suggested for the base, due to its strength in this size card. Use a light wattage iron (35w maximum) and be sure the copper pattern is clean before soldering.

• • •

Bill Heger of the Peoria RC Club suggests the Mighty Midget improvement shown in Fig. 4. Carefully drill out the original bearing holes, using a sharp 3/32" drill. Fit a piece of 3/32" brass tubing into place and solder to the brass strap. The brass strap may be made from .010 to .015 brass, formed to go over the top of the motor and down across the mounting flanges. A piece of 1/16" piano wire is used for the new shaft. Be sure the 3/32" O.D. tubing will take the 1/16" wire and allow for a smooth running fit. We have used the 3/32" brass tubing bushing several times (minus the strap over the motor) and have found it is much better than the original plastic bushings.

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Fig. 5 comes from Herman Rau of NYC and was used on the Simpl/Simul system. The rubber band centering was originally shown at the gear end of the shaft. This tends to pull the gears apart. Merely replace the shaft with a new one and place the pulley on the other end. Now, any wear or stress will not allow the gears to demesh.

• • •

Mr. O. Stettler, Philips A. G. Zurich, Switzerland has presented some very interesting data which shows that he has a patent on an electro-pneumatic control system, a simplified version of which was given in the February 1957 issue of MAN. Designed for full scale aircraft, the system by Mr. Stettler is much more complex than that used by Kurt Stegmaier of Germany. The system was based on reed operation, but the novel feature was the use of an electro-mechanical device for generating the low-frequency tones. Herr Stegmaier is to be congratulated on his revision of such a system to model use; however, it would only be right to point out the work done by Mr. Stettler. Those RC fans who really want to delve into, should order U.S. Patent number 2,385,657. Patents can be obtained from the Commissioner of Patents, U.S. Patent Office, Washington, D.C. for 25 cents each.

CLUB NEWS

The Flying Bisons of 'round Buffalo, N.Y. have a club paper, the Bison Beep Box. Cliff Barber, 143 Pilgrim Road, Tonawanda, N.Y. is editor; Fran Ptaszkiewicz, Joe Messing, Bud Marsh and Harold Hoffman being pres. V.P. Sect., and Treasurer respectively for 1959. This is an active club and all RC fans in the area are invited to join.

• • •

The Peoria (Ill.) RC Tattler states that Vern Springer has developed a new servo to replace the compound escapement. It is claimed to be faster than a compound and so far (?) hasn't missed a pulse. A disheartening note we noticed was the reluctance of some of these club members to have to drive 25 or 30 minutes to get to what seems to be an ideal flying site, complete with two excellent runways. They don't know how lucky they are.

• • •

From the DCRC Newsletter we learn that pylon racing is catching on in the Washington, D.C. area. At an October contest, Walt Good did 37.7 mph, Joe Salko 33.0 mph, Bill Hershberger 32.4 mph, Don Clark 31.0 mph and Jim Reed 30.0 mph. This was pretty good flying considering that the wind shifted 90 degrees during the flying session, a factor which upped the fatality rate. Here is an event that will really benefit when super-het receivers become popular. Nothing like six to 10 planes in the air at a time. If you're getting tired of the same old maneuvers, Walt Good suggests you try the pattern shown in Fig. 1. It's a vertical eight, executed by first doing an inside loop, followed by a split-S at the exit of the loop and then going into an outside loop, rolling out at the top. Accidental or otherwise, we've seen this maneuver performed with rudder only.

• • •

Before closing Club News this month we'd like to report a few comments of interest from Mr. Macnabb, of CitizenShip. With the new frequency allocation there should be an incentive to the real RC modeler to see that equipment is developed to take advantage of the frequencies. Suppose someone in your area develops a good super-het that will provide the necessary discrimination. Does this mean he can go out and fly to his heart's content, at the same time interfering with everyone who does not have his type of equipment? If he cannot, progress is stopped and we will all be delayed in realizing the many exciting benefits promised by the newly approved "spots."

NEW ITEMS

Ace Radio Control announces a relay contact burnisher for 70 cents. Made by Jaidinger, this unit is tops for cleaning relay contacts and assures you of more trouble-free operation. Ace also has a variety of crystals, such as: 13.4975 for doubling to 26.955mc at $4.50 and a 27.145mc for $3.95.

• • •

World Engines, Box 136, Montgomery Station, Cincinnati 42, O., has in the works a ready-built Astro Hog. For $129.95 you get the airplane, complete with engine, tank, wheels and all linkage to rudder, elevator, ailerons and engine. You install your radio gear and actuators.

Also by World Engines, the SM-2 receiver, designed by Jack Port, is available less the battery pack, but including the switch and meter jack, for $19.95. The complete receiver with battery holders and cables, suitable for shifting into several planes can be had for $25.95.

• • •

CG Electronics, Albuquerque, New Mex. may soon have two new VO cells available. The VO-D cell of about 1.75 AH capacity will fit any holder using a conventional D-size flashlight battery and the VO-180 will have a diameter of 1-1/32", the same as a C cell in diameter but much shorter. Incidentally, these VO cells, which you'll be hearing more about in the near future, are already making a name for themselves in several portable radio sets, electric torpedos, ground support equipment for the Thor and Bomarc missiles, flight operation of the Nike missile and are in the nose cone of the Titan missile. Nice part about these cells are the low price and excellent electrical characteristics. CG also reports that their RT-1-3V and RX-1 receivers will now be given a guarantee on operating specifications. This is truly a first with CG, since manufacturers have not done much more than state how equipment is supposed to operate.

• • •

It is hoped that by the time you read this, any difficulty in securing orders through Ace R/C East has been eliminated. The new address for Ace R/C East is 3029 West Cary Street, Richmond, Va. Mr. William Franks of the Hobby Center in Richmond will carry on for Ace Radio Control in the east.

• • •

Micro Switch of Freeport, Ill., a division of Minneapolis-Honeywell Regulator Company announces a new ultra small micro switch. For RC use, this switch will handle ½ amp at 125vdc and is of the SPDT variety. Roller and lever type actuators are available and easily attached. Check your local radio supply or electrical shop for more information. Ask for data sheet 146.

• • •

For those wanting an epoxy resin for making a permanent joint, unaffected by solvents or fuel, try the kit put out by Houghton Laboratories, Inc., Olean, N.Y. Known as Epoxi-Patch, Kit 1C, the kit is a two part system, a base resin and the catalyst or hardener. Merely squeeze out equal lengths of material, mix thoroughly and you'll have a cement that sets in two hours and cures in 24 hours, at room temperature. You can't beat epoxy resins for holding power and strength. They stick to practically anything and like we said, are unaffected by fuels. Another epoxy kit is marketed by Emerson & Cuming Inc., 869 Washington Street, Canton Mass. These epoxies will bond permanently to metals, plastics and ceramics and are excellent for molding or sealing in plugs and sockets to wires.

• • •

Why put your sacroiliac or larynx out of commission when field testing equipment? For $3.98 you can get a set of two self-powered hand held telephones. Operating from a single 1½ volt battery in each hand piece, communication can be maintained for any distance used in checking a receiver/transmitter setup. Two light gauge wires are used to connect the two units. These are available from the Radio Shack Corp., 730 Commonwealth Avenue, Boston 17, Mass.

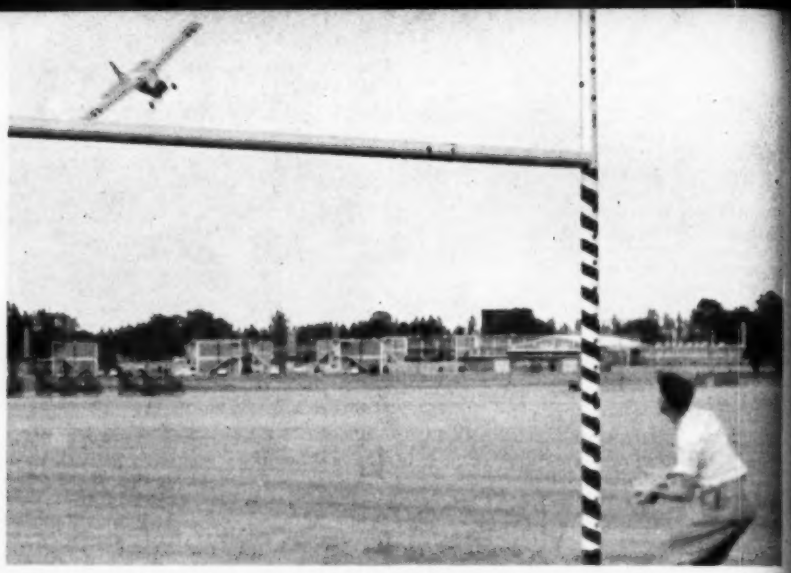
• • •

The E. F. Johnson Co., Waseca, Minn. has a new miniature trimmer capacitor which might be just the thing for that miniaturized transmitter you're planning. Exclusive of terminals, they measure about 7/16" square and ⅝" long and have a screw driver slot for adjustment. These air trimmers can be obtained from radio supply houses carrying the Johnson line. Maximum capacity range is suitable for the 26.995-27.255mc band.

RC aerobatics made Simple

by DON KIMSEY

You can do more stunts on less dough with escapement than by any other means—proved tricks set you up.



Sharpening up his technique, author puts his Livewire Trainer between the goal posts—not recommended for beginners! Many suitable kits can be used for stunts on single-channel.

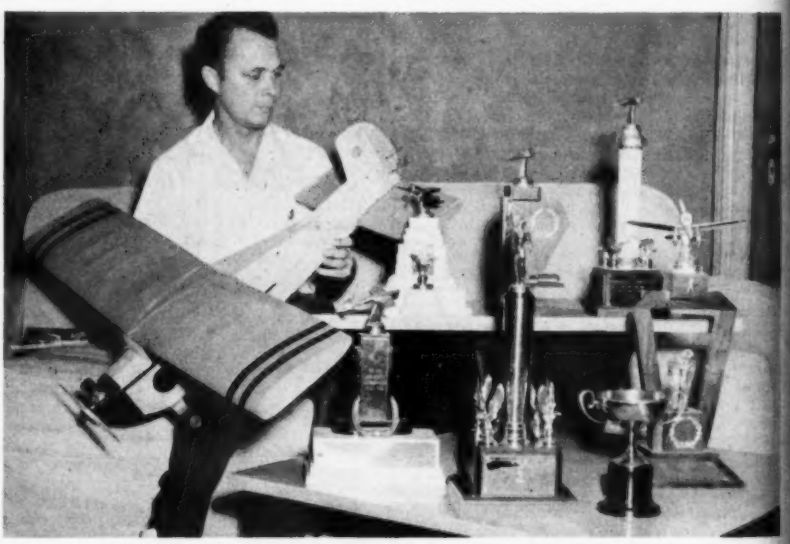
► Even beginners can "wring out" an RC job safely and with great precision —if a few simple rules are followed. A little practice and you can stack up winning points in competition.

Hundreds of modelers do an excellent job in the routine handling of their planes, including the precision flight pattern. But "advanced stunts" are another question. Nine out of ten stumble in this category, or go about it half-heartedly. Just as our most noted real life aerobatics pilots "tune up" and prepare for such advanced work with their planes, so must you with your radio model if you're to do it right.

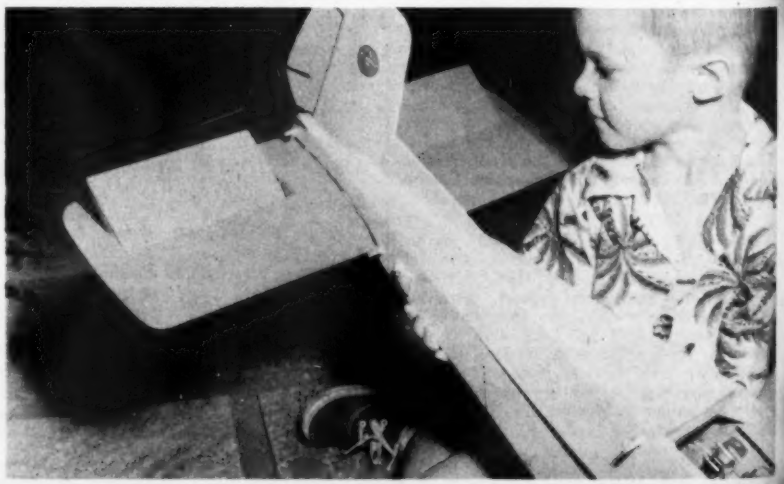
Elaborate equipment is not needed. No big outlay of cash or months of sweating over a workbench are necessary.

For example, the writer has taken first place in multi at the Greater Southeasterns using only a single-channel plane rigged to give rudder, motor and elevator control. The plane was built from a $6.95 kit, and took only seven days of part time work to construct and test. This same airplane has won or placed high in at least another dozen multi radio events. And the pay-off came strictly from the precision aerobatics—not just by taking off, flying a few figure eights, a square or so and plopping down for a landing. How is it done?

It's simple. Throw away the complicated rule books and dazzling formulas. Get back to some simple, solid model building. Become thoroughly acquainted with the meaning and techniques of advanced aerobatics. This is very important. It means you've got to put in some study time "on the ground" before you whiz around in the air. Study closely the names and drawings of the advanced (*Continued on page* 53)



Hardware to prove it—much of it won at major meets against the multi monsters. Good mag project is Triple Threat, capable of vertical and horizontal eights, cascaded Vari-Comps.



Elevators must be aerodynamically balanced, and sensitive, easy-to-work microswitch—with feel and audible click, for hand, necessary to work fast escapements needed for reliability.

The Wonderful Years

(*Continued from page* 10)

The next month, March, an ad for the Aeriole appeared. This was described as the complete model aeroplane. It had twin screws and would fly 20 yards. The ad called it "A Real Flying Machine", saying further that it was a true airship, entirely different from a helicopter or balloon. The price was $2.00. In December of that year another ad by the Airplane Toy Co. at 15 Myrtle Ave. in Brooklyn stated, "all our toys actually fly."

Companies that sold full-sized aircraft, also sold model aircraft supplies. One ad offered kits for the following scale models: Cody D, Farman B, Bleriot XII C, Wright E, Curtiss A, and 25 other different aircraft designs. These were all rubber-powered models to be flown in competitions and the ad claimed that they would fly from 150 to 1000 feet.

One of the earlier model making manuals published in 1903 explains why a curved surface is better than a flat surface for lifting power. It even predicted the coming of jet aircraft—"a diverted jet of gas or air, stored under pressure would, if rightly applied, be far more efficient than a rotary motor." There were instructions for building a kite equipped with a rubber-driven propeller that was tripped into action by a cable when the kite was already up. This manual also explained how to split bamboo, cover cells with light cardboard, use cement on linen strips for joints, avoid splitting bamboo by overlapping its joints, and binding them with strong thread that was then covered with thin cement. Surfaces were finished by sizing them and then giving them two to three coats of damar varnish.

Six years later in 1909 a model airplane manual gives instructions for laying out wing-section templates. It then shows how to shape ribs for it from U-Section umbrella ribbing. The umbrella rods were first annealed by heating them cherry red and plunging them into sand to cool. Then the parallel edges of the rod were cut in V notches with a three-cornered file and then slowly tapped into shape on the template. When the joints were all closed, they were brazed for strength. Other instructions were given for attaching fabric to the plane's framework, propeller layout, handy winding gadgets, and plans for compressed air motor with an aluminum tube for the pressurized air. The favorite technique was to enclose the rubber motor strands in a paper tube. Balsa is not mentioned since it was not until 1912 that it was first imported into this country.

Courses in building flying airplane models were started in October 1909 under the direction of Wilbur R. Kimbal, at the West side YMCA, 318 West 57th Street, in New York. The models were flown on a big athletic field located at 57th Street and 8th Avenue.

On November 27, 1909 a contest was held at the West Side YMCA for the Lewis

(*Continued on page* 40)

R. Adams Cup. A name that was to become important in model airplane circuits appears as a winner. This was a Dr. Dederer whose plane won with a distance of 92 feet 1 inch, Walter Phipps who was now president of the Junior Aero Club came in second with 83 feet 2 inches, and James K. Dalkranian was 3rd with 77 feet 6½ inches. Fourteen machines had been entered in the contest.

About a week later on December 4th, a contest was held at Frank Gould's Riding Academy. There were 15 entries. Again Dr. Dederer led with 112 feet 11½ inches, Percy Pierce second with 87 feet 6½ inches, Wilson Marshall Jr. came in third with 69 feet 6½ inches.

A model Bleriot was shown at this contest by a Mr. Sage which was considered to be an unusually good looking job. Because of the long flight of Dr. Dederer's plane, the YMCA was compelled to get larger quarters. They succeeded in getting the 22nd Regiment Armory and on December 11, another contest was held there. Again of the 15 entered machines Dr. Dederer's came in first with 147 feet 6 inches, Percy Pierce, second with 105 feet, and C. C. Graves from Newark, N.J., third with 97 feet. Since this was Dr. Dederer's third win, according to the rules the cup became his property. After he had won the cup, a representative of Automobilia and Flight informed the "Y" that they would donate a solid silver cup, to be competed for by men.

In the contests that followed, two new rules were important. One was that the machine start from the ground and the other that the models must be built in such a manner that a man carrying machine could be built from the design of the model. Another contest was planned for boys for a silver cup trophy given by Leo Stein. After a layoff of a number of weeks owing to all the models being on exhibit in Boston and Newark, the "Y" contests at the 22nd Armory were continued on Saturday, March 5, 1910. A cup for the boys' class was offered by Edward Durant to the boy winning the first three legs. The A. Leo Stevens cup for longest distance flight in 1910 was placed on exhibit on March 5. The cup was about two feet high and beautifully engraved. On March 5th, the men's class contest was held. In order the winners were: W. Merrill Sage, with a Wright biplane—71 feet 4 inches; M. P. Talmage with a Curtiss biplane—53 feet 2 inches. There were 24 entries.

Winners in the boys class were in order: F. M. Watkins with a monoplane original —121 feet 7 inches. Another contest held March 12th had as winner Merrill Sage again with a Wright biplane—81 feet 5 inches. Winner in the boys' class was D. Frier with a Langley two-propeller model which flew 133 feet. Frank Schober brought a Bleriot model which measured six feet long with a seven-foot wing spread. It was a well-made and powerful machine, but on one of its first trial runs it ran into a spectator and smashed a wing and a propeller. Schober promised to have it ready for the next contest. It showed every sign of being a sure winner.

The next contest was scheduled for March 26—two weeks ahead. Some of the contestants complained that this would not allow them enough time to work on their machines. So the "Y" decided to hold contests on a bi-monthly basis to give the model builders enough time to get their machines into good condition.

The Aeronautic Society held its first elimination contest for teams of three to

represent in future competitions for the Octave Chanute Challenge Model Cup on March 3rd at the 69th Armory in New York. This was open to boys and men. A boy named Frederick M. Watkins won with an original monoplane that flew 148 feet.

At an Aero exhibit held in Boston on February 23rd 1910, the Church Aeroplane Co. sold out all their model planes. One wealthy Bostonian ordered a $75, two-inch-to-the-foot model of the Voisin biplane. The Boston "Y" showed models. The International School of Aeronautics showed a model of the Baldwin dirigible, the Harvard Aeronautical Society showed a Bleriot and Wright model. Charles F. Duxant, son of the first American Aeronaut, showed a flag carried by his dad in his pioneering flights.

In April 1910, the National Model Aero Club was started at 282-9th Ave. N.Y. Its purpose was to control and regulate all competitions throughout the United States and to promote exhibitions and contests. The regulations called for machines less than six feet in any dimension. The club was not meant to compete with any other existing clubs but to cooperate with them. There was a senior and junior membership limited to those under 21. Officers were W. H. Crocker, president; W. Merrill Sage, first V.P.; C. W. Wilcox, second V.P. The object of the club was to promote study of problems as demonstrated by models, and to secure the dissemination of information about model airplane making.

On Saturday March 29, 1910 the "Y" held a contest at the 22nd Regiment Armory and, on April 2nd, another contest was held at the 14th Regiment Armory in Brooklyn, where 22 machines were entered.

On April 8th 1910, something unique in ariplane model demonstrations took place. This was a simulated flight across the English Channel. This was on an evening of the French Fair at the Metropolitan Opera. The space between the balconies of the Metropolitan Opera House in New York were to represent the English Channel. A certain Mr. Lesh flew his model plane across the "channel" and won the silver cup offered by Henry Chapal.

The National Model Aero Club drew up a set of 24 rules for contests. Some of these make interesting reading today. Rule No. 1: These Rules shall apply to indoor and outdoor contests, and shall be enforced at all open competitions. Skipping a few, Rule No. 5: Every machine competing must be built or designed by the competitor (no toys allowed). Every machine must be built on practical lines, that is in a form capable of development to a man-carrying machine. Rule No. 6: A machine must conform to the following—a. must be equipped with suitable wheels or skids, b. motive power must be self contained, c. must be capable of starting under its own power. Rule No. 7: All machines must be started from a table or platform which shall not be over three feet in height from the floor or ground; distance of flight shall be measured from the edge of the platform and shall be in the right direction of flight. Rule No. 8: Each contestant shall be allowed three trials in every class for which they are entered. No flight shall be counted as such unless the machine covers more than 20 feet. But only one such "no start" shall be allowed. If any machine collides with a spectator or suffers any interference within the line of flight, that flight shall not be counted against the competitor. Any machine which turns over in the air or alights

(*Continued on page 45*)

Bulletin Board

► Most important and far-reaching item pinned on the Bulletin Board this month is from Pan American World Airways—a draft copy of new PAA-Load Gas and Clipper Cargo rules with radical changes. Both are now limited to engines of .020 cu. in. to cut size, cost and difficulty of building the models.

PAA-Load Gas is reinstated but is now essentially the same as PAA-Load Jet. No dimension of the gas model may exceed 36 inches. It must weigh empty at least four ounces and the 1 x ⅜ x 1⅜ inch dummy must weigh at least one ounce for a total of at least five ounces. Requires at least two-wheel gear and visibility front and side of at least one-half inch square. Six attempts to make three officials, at least one of which must be unassisted ROG. Total of three best (including one ROG) is your score.

Engine run is defined in the power plant specifications as follows: "Fuel quantity (in the tank of the standard, unaltered .020 cubic inch maximum displacement engine) to that amount necessary to operate the engine at maximum rated speed for 30 seconds." But until such engines are readily available (one manufacturer already has plans to sell such an engine) you may modify current engines or use a timer with a maximum limit of 30 seconds.

Clipper Cargo rules for engine, dummy, visibility, empty weight and landing gear are the same as above. But the maximum dimension is lifted to 42 inches. Cargo jobs must carry a completely enclosed simulated load at least 1 x 1 x 2 inches and weighing at least one ounce, which makes minimum take-off weight six ounces. Unassisted ROG is a must and duration must be at least 45 seconds. You get at least six attempts but not more than 12 and your score is the total gross weight on your three best attempts. Gross weight, of course, is the total take-off weight including model plus fuel plus dummy, payload, and ballast, if any.

In short, now you can build 'em heavy.

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Inflation has finally caught up with the AMA. After eight years with the same basic dues, the rates are up for 1959: $2.00 for Juniors, $3.00 for Seniors, and $4.00 for Open age division. The extra dough will go largely for increased AMA costs (some up 60% since '53) due to the steady inflation we've been having, but some will be reserved for a World Championship Fund—and it's about time.

• • •

Ed Mazan's *Windmill* autogiro in December MAN brought a letter from Kellett Aircraft Corp. They manufacture full scale giro's for crop-dusting, forest fire patrol, pipe line inspection, geological exploration and several other suggested uses. Yep, the old 'giro's far from dead.

• • •

Our modeling friends in Canada seem to be having a special competition—with club publications. But we can't tell who's winning, the Vancouver Gas Model Club with their *Hot Head* or the Montreal Model Flying Club with their *Bulletin*. Both are great reading, full of local and general news, sharp editorial content, humor, interesting articles and even plans for hot con-

(*Continued on page* 45)

GUILLOW'S DESIGNER USES AMBROID!!

Famed model plane kit designer Lou Andrews is seen here with his latest Guillow "Explorer" Radio Control Trainer. With a wing span of 56" and wing area of 560 sq. ins., this exciting (fully acrobatic) R/C ship takes all .15 to .25 engines. Naturally, Lou used Ambroid Cement to build this prototype — as with all the other models he has built in the last 25 years

"In using Ambroid Cement" — says Lou Andrews — "your choice could not have been wiser. There is great satisfaction in knowing that each and every part of your model is held together with a cement that far surpasses all of todays model builders requirements". To which glowing endorsement, Guillow's Earl Smith adds that "Ambroid is the finest model cement available anywhere — any time!" The fact is, we at Ambroid have never had to dream up high-flying advertising copy to boost our product — since the nations top model designers, kit manufacturers and contest fliers have long been singing the praises of Ambroid for us!

However, its only fair to cement brands "B" and "C", to point out that you can definately save a few pennies by using them instead of good old brand "A" (that's us!). Unfortunately, you won't get anything like the tremendous structural strength of an Ambroid-built model, so maybe its a good idea to ask yourself if you can afford to settle for lower-priced cement. Obviously, the members of the Klamath Wildcat Model Club, of Oregon, have no doubts about which type of cement they prefer. Recently they used no less than ninety 60¢ tubes (or 11 pounds) of Ambroid on their 1/4 scale, 18 foot long "Snark" missile replica! Of course, one or two tubes of this size are plenty for most projects tackled by model builders. But large or small, the main thing is to always insist on Ambroid. Our slogan, printed below, is a plain statement of fact — and is all you need to remember when thinking of buying cement.....

"REGULAR" AMBROID — FOR MAXIMUM STRENGTH CONSTRUCTION (NOW FEATURES PLASTIC SPREADER CAP)

"EXTRA-FAST" AMBROID FOR LIGHT MODELS & AIRFIELD REPAIRS

"REGULAR" AMBROID
1-3/4 Oz. Tube . 30¢
4 Ounce Tube . . 60¢
1 Pint Can . . $1.75

AMBROID SOLVENT
1 Pint Can . . $1.35

"EXTRA-FAST" AMBROID (Model Airplane Cement)
20 cc. Tube . . . . . 15¢

"SYNTHE-WOOD" (Ideal as a filler & for fairings)
4 Ounce Can . . . . 40¢

In Every Field There's A Leader — In Cement It's AMBROID

AMBROID CO. • BOX 30 • WEYMOUTH 88 • MASSACHUSETTS

The Wonderful Years

(*Continued from page* 41)

improperly shall be disqualified for that flight. In the outdoor competitions all machines must be started facing into the wind. Rule No. 9: Special prizes may be given for stability, excellency of construction, originality of design, and special contests. (See diagram of official landing area of NMAC rules.) Any machine alighting properly within the lines qualified as a flight.

Model airplane contests had become a regular part of inter-school competitions. In May 1910 the seven following schools in New York were holding contests, (69, 77, 78, 1311, 1611, 166, 173).

In June 1910, the Junior Aero Club issued a challenge to all Aero Clubs to enter a model contest and in that same month an American model airplane maker took the first prize at an international meet held in Paris, France.

The hobby was truly international—and is still going strong!

Bulletin Board

(*Continued from page* **42**)

test ships. Editors are: C. R. Goguillot (*Hot Head*) and Barry Haisman (*MMFC Bulletin*). Congrats on a good job.

• • •

Babcock Models is coming out with a crystal-controlled, super-heterodyne, fully proportional system called the "ProSuper." Aim is to get pinpoint selectivity in order to use simultaneously all six new RC channels bunched around 27 megacycles. Babcock envisions "six RC models flying a closed course (pylon race) all at the same time."

• • •

Mid-Western States Championships, in Kokomo, Ind., had some interesting events, we hear. For instance, three-at-a-time combat and a "weirdie" event for "things" that fly but really aren't airplanes. Examples of this were a "flying dust pan", a "free-flight kite" and a "flying out-house." One thing we like—pit crews of winning Rat Racers get medals.

• • •

From Chuck Tracy's Model Aviation column in the Cleveland Press comes the suggestion by Larry Mzik that there be separate indoor record categories for limited ceilings. Point is that only East and West Coast modelers get to fly in blimp hangars, says Mzik. Actually, we hear gripes from Westerners that the only time they get into NAS Los Alamitos is every four years when the Nats are there. Also, what ever became of the blimp hangar at Akron?

Easterners do get into both NAS South Weymouth, Mass., and NAS Lakehurst, N.J.—as a result of steady efforts by modelers to promote Navy help. Mainsprings in this have been Ed Dolby and Tony Becker.

As for stirring up interest via record attempts, suggest maintaining club records, city records or site records. This stirs up plenty of local competition and it's often far more compelling than shooting for national marks.

• • •

And speaking of indoor, the excited cry of, "There's another IRBM!" was recently heard in Hangar No. 6 at Lakehurst during a record trial. What's it mean? Bill Bogart of Baltimore answers, "Into Rafters By Mistake."

• • •

Nordic glider fan Peter Becker, RFD #2, Woodbury, Conn., issues an "emergency call" to modelers in the Waterbury area to help him find a Hobby Grinder. There's no question that this device can easily be converted into an excellent tow-line winch. They're usually found in five and dime stores for about $1.39. Failing all else, try writing the manufacturer to find out who distributes the item in your area. It's made by G. M. Mfg. Co. Inc., 13-08 43rd Ave., Long Island City, N.Y.

• • •

Las Vegas (N. Mex.) Prop Busters write to say they've got a going bunch, fly mostly control line, some RC and FF, hold a monthly club meet and an annual open meet. Interested? Contact Joel Richardson Jr., 747 Lee Drive, Las Vegas, New Mex.

• • •

New gadget on the market for outside-the-circle control line flying. Called "Controlon", it has center pylon with control out beyond circle. Made by Controlon Co., 6913 Sprague Rd., Cleveland 31, Ohio.

The "Detroit" Stunter

(*Continued from page* 12)

into great detail here.

Wing Construction: Cut the two rib templates shown on the plan from light sheet metal. Sandwich 13 pieces of 1/16 x 2 x 10" balsa between the templates, and bolt together with ¼" bolts through the holes shown. Carve and sand down to the templates and you have half of the ribs needed. Note that one of the tip ribs is discarded, as the outside wing is one panel shorter than the inside. Trim the four center ribs down 1/16" to accommodate the center section double sheeting, cut out the main spar and the trailing edge pieces, and you are ready to start construction.

Fasten the lower half of the trailing edge to a flat board. Slip the ribs onto the main spar, cement them firmly to the trailing edge, and install the 5/16" sq. leading edge. Do not cement the ribs to the main spar permanently at this time!

Install the bellcrank floor, cutting out the center of the main spar as necessary to clear the bellcrank. Put on the upper half of the trailing edge and the filler strip. You now can pick the wing up and put on the center section and leading edge sheeting.

Now is the time to check the wing for warps. If you have any, twist the wing straight and block it up in this position. Cement the ribs to the main spar and you will have a straight wing which will stay that way. The wing tips and flaps now are installed, and the pushrod from the bellcrank hooked up. Cement in the plywood landing gear floors, add the cap strips, and the wing is complete.

Fuselage Construction: Start by cementing the 1/16" plywood doublers to the inside of each fuselage side. Notice that

(*Continued on page* 48)

SENSATIONAL!

ONLY $2.50

FOKKER TRIPLANE

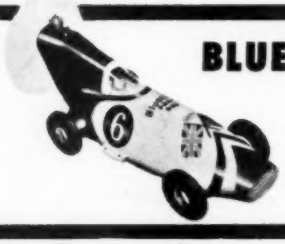
Excitingly new U-CONTROL thriller from Scientific! 3 big wings mean smoother, easier take-offs and landings . . . plus maneuverability like you never dreamed possible. The scale model powers with ½ A gas engines .020 to .074. It's all prefabricated, too, for quick and easy assembly (carved balsa fuselage, of course).

BRAND NEW!

FORNEY, AIRCOUPE

$2.50

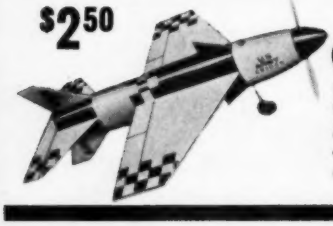
Brand new! Scale model of the famous private plane. 18" span, for .020 to .074 engines. Prefabbed. Carved fuselage.



BLUEBIRD prop rod racer

Low cost, big value propeller driven race car that actually speeds over 50 m.p.h. Very colorful, too! For ½ A gas engines. Prefab kit. Carved balsa body. $2.95

$2.50



Supersonic GUIDED MISSILE

Real "space age" U-CONTROL ½ A gas flying model. Easy to assemble—a thrill to fly (can take off vertically, too). Prefab kit has carved missile fuselage.

$1.95

MESSERSCHMITT ME 109

U-Control scale flying model of the famous German "Desert Fighter". 18" wingspan, for ½ A gas engines .020 to .074. Prefab. Carved balsa fuselage.

"Snark" Guided Missile $2.95
SPAN: 22" For .049 to .09 Eng. Realistic "guided missile" model that you fly U-Control. All prefabbed. Carved missile fuselage.

KINGPIN $1.69
SPAN: 14" For .020 to .049 Eng. Brand new profile stunt model with a big 80 sq. inch wing. U-Control flyer. All prefabbed.

Super Stunt Master $2.95
SPAN: 20" For .049 to.099 Eng. It's big! Terrifically colorful, too. Deluxe U-Control stunt model. Carved fuselage, etc.

North American F-51 MUSTANG $2.95
SPAN: 23" For .049 to .099 Eng. Great big, deluxe U-Control scale model of famous fighter. Prefab kit, carved fuselage, etc.

Gee Bee Sportster $1.95
SPAN: 18" For .020 to .074 Eng. Brand new U-Control scale model. An excellent performer. Kit is all prefabricated. Carved fuselage.

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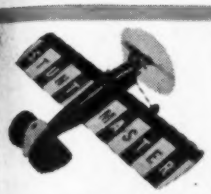
SCIENTIFIC MODEL AIRPLANE COMPANY
113 M 2 MONROE ST., NEWARK 5, N. J.
If no dealer is available, add 25¢ (postage & packing) to cost of model



STUNT MASTER $1.95
SPAN: 18" For .035 to .099 Eng.
Very popular ½A stunt plane. Highly colorful . . . terrific action. Super prefabricated kit.

AIR CHAMP $2.95
SPAN: 18" For .049 to .099 Eng.
Deluxe' U-Control biplane stands up to much rugged flying. A real beaut. Prefabbed, carved fuselage.

F7U CUTLASS $2.50
SPAN: 18" For .020 to .074 Eng.
Sensational fly-it-yourself model of 700 m.p.h. jet fighter. Fly it U-Control. Prefab. Carved fuselage.

LITTLE STINKER $2.95
SPAN: 16" For .020 to .074 Eng.
"Pitt's Special" championship stunt flyer. Highly colorful model. All prefabbed kit.

LITTLE MUSTANG $1.95
SPAN: 18" For .020 to .074 Eng.
Famous escort fighter model. Completely prefabbed. Features carved balsa fuselage, formed balsa wing.

E-Z TRAINER $1.29
SPAN: 18" For .039 to .074 Eng.
Big value deluxe profile trainer with "jet fighter" styling for U-Control. Prefab w/bubble canopy.

Choose Your Favorite Model!

BUT BE SPECIFIC . . . SAY "SCIENTIFIC"

ZIG-ZAG $1.69
SPAN: 18" For .020 to .074 Eng.
Fast! Colorful! Here's a red hot U-Control model with real get up and go! Prefab. Carved fuselage.

F4U-5N "Corsair" $1.50
SPAN: 18" For .020 to .074 Eng.
Profile fly-it-yourself model of this famous WW II fighter. It's U-Control, flies like a dream. Prefab.

P-40 Flying Tiger $2.50
SPAN: 18" For .020 to .074 Eng.
Our popular U-Control model of this Curtiss World War II fighter. Prefabbed with carved fuselage.

GOLDEN HAWK $2.50
SPAN: 18" For .020 to .074 Eng.
Big expansive wing . . . extremely colorful model for U-Control flying. Carved fuselage, prefabbed.

B-66 Jet Bomber $2.50
SPAN: 18" For .020 to .074 Eng.
Famous Douglas jet bomber that you fly U-Control. Drops bomb in flight. Prefab. Carved fuselage.

SPORT RACER $1.69
SPAN: 18" For .020 to .074 Eng.
A good U-Control performer at a remarkably low price. Completely prefabbed kit. Easy to assemble.

Stuka Dive Bomber $2.50
SPAN: 18" For .020 to .074 Eng.
Something new! This U-Control thriller drops bomb as you fly. Prefabbed with carved fuselage.

No. Am. Trainer $1.50
SPAN: 18" For .020 to .074 Eng.
North American's U.S.A.F. T-28 training plane. Now you fly it U-Control. All prefab., profile model.

Beech "Bonanza" $2.50
SPAN: 18" For .039 to .074 Eng.
A real "beaut" of a model. It's authentic scale. . . . for U-Control flying. Prefab. Carved fuselage.

Cessna 182 Tricycle $1.95
SPAN: 18" For .039 to .074 Eng.
Scale fly-it-yourself model of famous private plan. All prefab w/carved fuselage.

BRITISH S.E.5 $2.50
Bi-Plane For .020 to .074 Engines
Exciting U-Control gas flying model of this British World War I ace fighter. Prefab with carved fuselage.

BULLET $2.95
SPAN: 24" For .020 to .099 Eng.
Bullet-like styling . . . bullet-like performance. Big 24" wingspan on this U-Control thriller. Prefabbed.

FORD FLIVVER $1.69
SPAN: 18" For .020 to .074 Eng.
Prefabulous U-Control flying model of Ford single seater. All prefabbed with carved fuselage, etc.

No. Am. "Texan" $2.50
SPAN: 18" For .020 to .074 Eng.
Authentic scale model of the USAF AT6 Trainer. A top-notch "fly it yourself" model. All prefabbed.

RED FLASH $1.69
SPAN: 18" For .039 to .074 Eng.
Fast! Colorful! U-Control thriller that's easy to fly and a cinch to assemble. Super prefabricated.

Piper Tri-Pacer $1.95
SPAN: 18" For .039 to .074 Eng.
Scale U-Control flyer with a tricycle landing gear for safe landings. Prefab, carved fuselage.

Torpedo Speedboat $2.50
For Gas Powered OUTBOARD Eng.
Length 20", Beam 8"
Genuine mahogany veneer hull. A real speedster. All prefabricated.

Stits "PLAYBOY" $1.95
SPAN: 18" For .020 to .074 Eng.
One of our hottest looking and performing U-Control planes. Styled from Goodyear Racer. Prefabbed.

AMERICAN BOY $1.29
SPAN: 18" For .020 to .074 Eng.
Extremely popular U-Control trainer at a big bargain price! It's profile and all prefabbed.

MR. MULLIGAN $2.50
SPAN: 18" For .020 to .074 Eng.
Scale flying model of famous trophy race winner. U-Control. Prefabbed. Carved fuselage. A real thriller!

"ELDORADO" $1.69
14½" Long. For Elec. Outbd. Mtrs.
Fast, sleek speedboat — really modern w/wrap-around windshield & swept wing fins. Prefab.

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the sides are made of ¼" balsa. This is done to allow for rounding of the sides, which looks much better than the usual slab sides.

Mark the engine beam location and the wing and tail cutouts, using the top of the fuselage sides as a reference line for all dimensions.

After cementing in the engine mounts, tack the cement fuselage sides together at the rear and install the engine. The location of the engine is given to the center line of engine on the drawing. The distance from this point to the spinner is determined by the engine used, and your choice of crankshaft extension, if any.

No firewall is used behind the engine, for the simple reason that it does nothing to stiffen the front end that the engine doesn't do better, and it gets in the way when working on the engine or tank.

Cement in the ¼" plywood bulkhead just forward of the wing, and the 1/16 x 2" dia. plywood ring behind the spinner backplate. Install the ¼" balsa gas tank compartment floor between the beams.

Stabilizer and Elevator Construction: The stabilizer and elevators are cut from ⅛ x 3" soft balsa. Carve and sand to an airfoil shape, tapering the thickness to about ⅛" at the tips. Install a large Veco control horn, and assemble the elevators to the stabilizer. The fin and rudder are made in a similar manner from ¾" balsa.

Assembly: Assemble the wing in the fuselage, being sure to align it carefully with the thrust line. Install the tail surfaces, at the same time completing the control hookup. Total movement of the control surfaces should not exceed 45° up or down, and the action must be absolutely free with no binding spots or spring to up or down. Freedom from spring is very important when the airplane gets to the top of the circle. Like most large airplanes, you will find the Strathmoor a bit loose on the lines at the top on a calm day. In an extreme case, a spring to up for instance can cause the ship to loop out behind your head in vertical maneuvers. At best, this condition can make smooth maneuvers impossible due to the amount of control changing as line tension varies.

Landing Gear: You may elect to mount the gear in the wing as shown, or you may wish to mount it in the fuselage. Either way is satisfactory, providing you have at least a 10" tread in the fuselage mounted type. You will notice that the wing mounted gear is built in the form of a torsion bar, to cut down on the amount of shock transmitted to the wing. While this gear, with its wider tread, is more stable on the ground, there is also a danger of damaging the wing in a rough landing.

Fuel Tank Construction: The fuel tank is made as shown on the plan from tin can stock, and held in place by "L" brackets soldered to the tank fore and aft. Bolt the tank to the engine mounts with 4-40 bolts.

Build up the cowl and tack on the top and bottom blocks. Carve and sand to shape, cut them off, and hollow out to about ⅛" thickness. Be sure that the wood selected for these blocks is very light, since there is a lot of wood here, and it can make a real difference in the weight of the airplane.

After the blocks are cemented back on, add the fin, rudder and dorsal fin. Build up fillets and fill all cracks with Aero Gloss Plastic Balsa. Note that the fin and dorsal are filletted in to look like a part of the top block.

Build up the wheel pants and fairings, cover the entire ship with "Jap tissue", and you are ready to start finishing. Make no mistake about it, getting a good finish on an airplane takes more work than building it.

Brush about five coats of full body clear dope on the wing and tail surfaces. Filler coats of dope and talc are brushed on all wood areas, and sanded smooth. This process is repeated until all grain is filled. The rest is just painting and trimming.

Ideal flying weight for the Strathmoor seems to be around 45 oz., but I have seen them go as high as 52 oz. and still fly a good pattern. Properly built and well taken care of, the Strathmoor will prove to be a sturdy, reliable airplane which will handle well on windy days as well as calm.

See you at the next contest.

. . . dawn to dusk

(*Continued from page* 20)

or dive (tank 12 in. behind engine) would starve or flood the carburetor. It was also confirmed that, with a Walker regulator installed in the system, the set-up would tolerate fairly wide variations in fuel head, though less than with a float chamber.

Fuel used consisted of five parts kerosene, three parts ether and two parts castor oil, with the addition of two per cent amyl-nitrate. This proved slightly more economical than standard commercial blends, while remaining reasonably tolerant to temperature change. Various other formulae were tried on the assumption that reducing both oil and ether content would increase the calorific value of the final mix, but, even with only 15 per cent each of ether and oil, no appreciable saving was evident. Delving deeper into the subject of economy fuel mixtures, however, may be expected to yield small gains. It has been found that the addition of benzene or nitrobenzene permits a slightly weaker needle setting, showing a measurable improvement in consumption. All experiments with fuels must, of course, be made with due regard to the weight of fuel consumed and not merely its volume, the specific gravity of kerosene, for example, being over 20 per cent more than that of ether. (Editor's Note—Amyl nitrate—not nitrite—is difficult to obtain in the States. The Ethyl Corp. has a Diesel fuel additive, containing amyl nitrate, used in our flight program. The castor-fortified oil was supplied by Castrol; obtainable at any motor cycle shop.)

Engine modifications were simple. The existing backplate was scrapped and a new, solid backplate was turned up and bored through the center with a 1/16 hole. A Fox 29R fuel metering valve was suitably modified by putting a thread on its horizontal nipple and screwing into the backplate and locking with a hexagon nut. A hex nut was also fitted to a new, lengthened, compression screw, so as to obviate any possibility of the compression adjustment altering in flight. The only other work on the engine consisted of polishing the piston head to delay carbon build-up.

The float chamber bowl was turned from clear acetate. The top was made from two layers of 1/8 acetate and one layer of 1/16, cut and filed to the required shapes and cemented together. Holes were drilled and tapped for the mounting screws, inlet and outlet nipples and screw filler cap.

The float was molded in fiberglass, using two layers of 1 in. x .003 woven glass tape and was fitted with a thin disc of aluminum at the top to bear against the needle base. The free-floating, weighted needle was made from the pointed end of a large darning needle, soldered into a brass base. Two aluminum brackets secured the float

chamber to the rear of the crankcase.

The fiberglass fuel tank was molded around the sides of the polythese picnic bottle previously mentioned. This was almost ideal as regards section and general shape and to ensure a last drop feed, one side (i.e. the tank bottom) was built up with modeling clay before the resin and glass cloth were applied. Inlet and outlet nipples with wide tinplate flanges were let in between the layers and locally strengthened with extra layers of cloth. Sheet laminates were made on glass (using a parting agent) to provide material for the tank baffles and ends. Card patterns were used as templates for the baffles, the two outer baffles being positioned by short locating strips inside the tank and cemented in position using resin. Finally, the end plates were butt jointed to the ends of the tank and reinforced with ⅜ in. glass tape, the completed tank then being rubbed down with garnet paper.

Total weight of the complete engine and fuel system came out at 9.3 oz. Normal tank capacity was 42 fluid oz. (44-45 oz. could be had by inverting the assembly during filling to allow air to escape through the delivery line) bringing the all-up weight with fuel (34-35 oz. avoirdupois) to approximately 2¾ lb.—just under the 3 lb. limit originally set.

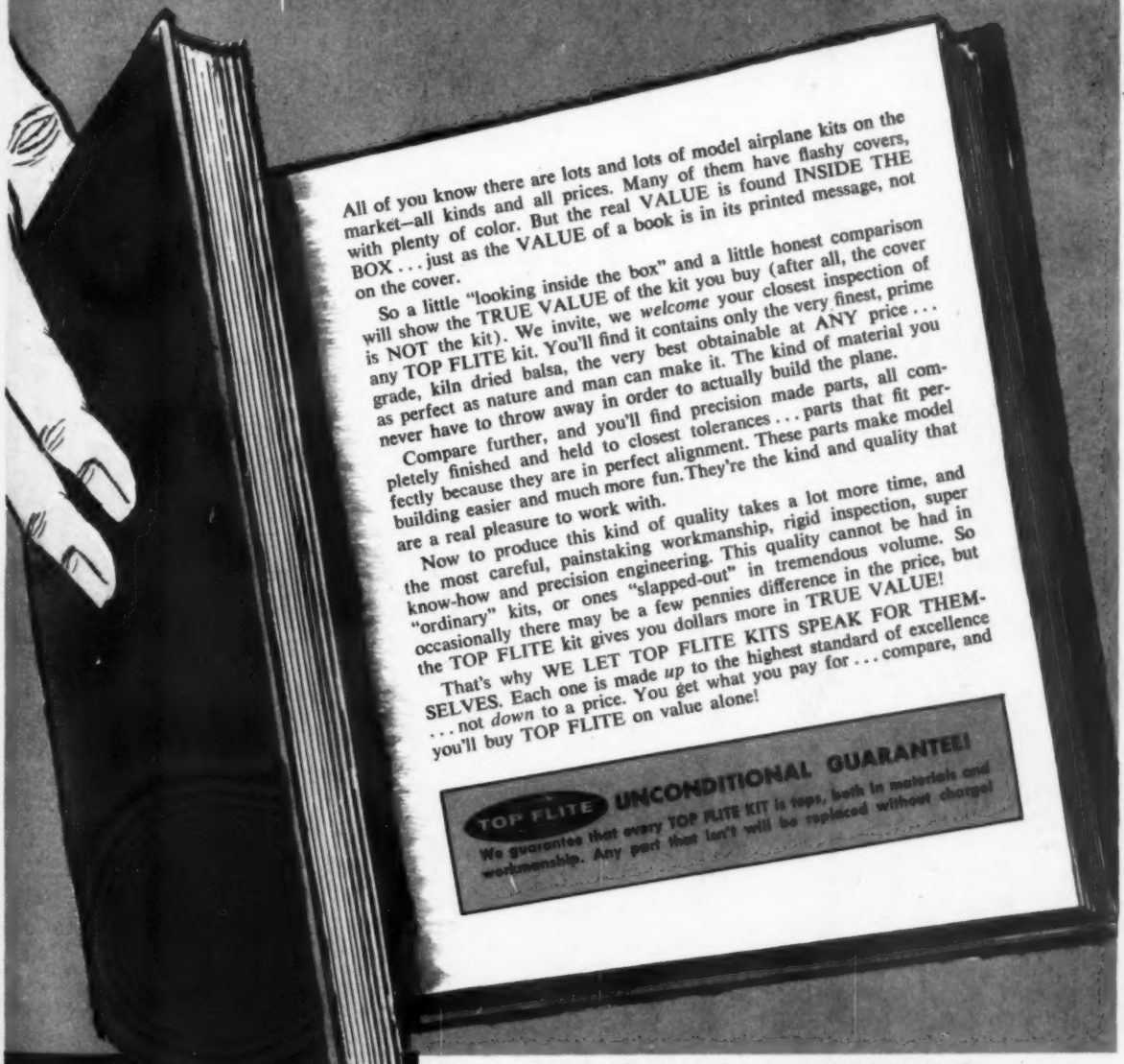
On bench tests, everything, to our intense relief, worked fine. The engine was set up and coupled to the tank with yard lengths of fuel tube. The float chamber was filled with fuel and the engine started. Very slowly the fuel level in the float chamber began to drop. We opened the pressure valve a couple of turns. Almost immediately, fuel began traveling along the delivery line, up and over into the float chamber. Now would the float valve hold the delivery pressure? Yes, the float had stopped rising and the fuel level was remaining constant. We opened the pressure valve wide. The level rose a little but then the needle held it again. We took hold of the tank, held it a couple of feet above the engine, then a couple of feet below. No flooding, no starving.

Numerous tests followed and the whole system proved extremely simple to operate. By this time the motor had been thoroughly limbered up from about 12 hours of testing and fuel consumption, at around 6,500 rpm static (10/4 and 10/5 wood props), had dropped to less than 3.5 oz/hr, under reasonably favorable atmospheric conditions. A full tank run now yielded 13 hours 20 minutes on the bench, equivalent to, perhaps, 12 hours in the air.

Since then, the rig has had many test flights of limited duration and has proved reliable, but there are still some questions to be answered. The combined effects of carbon build up on the piston and of changing climatic conditions (between a dawn take-off and midsummer afternoon heat) could materially affect the running of the motor after some hours—perhaps sufficiently to stop it. Diesels, relying on a close balance of compression ratio and combustion temperature to sustain operation, are more sensitive to such variables (especially when loaded for low rpm) than glow or spark ignition motors. We cannot, therefore, be absolutely certain that the present engine will run out a full tank of fuel in the air until this has been tried.

We do know, however, that the pressurization system and float chamber are reliable and will work just as long as the engine keeps going and we feel sure that others who have RC duration or distance record plans would find such a set-up well worth trying.

YOU CAN'T TELL A BOOK BY ITS COVER . . . SO WE LET TOP FLITE KITS SPEAK FOR THEMSELVES!



All of you know there are lots and lots of model airplane kits on the market—all kinds and all prices. Many of them have flashy covers, with plenty of color. But the real VALUE is found INSIDE THE BOX . . . just as the VALUE of a book is in its printed message, not on the cover.

So a little "looking inside the box" and a little honest comparison will show the TRUE VALUE of the kit you buy (after all, the cover is NOT the kit). We invite, we *welcome* your closest inspection of any TOP FLITE kit. You'll find it contains only the very finest, prime grade, kiln dried balsa, the very best obtainable at ANY price . . . as perfect as nature and man can make it. The kind of material you never have to throw away in order to actually build the plane.

Compare further, and you'll find precision made parts, all completely finished and held to closest tolerances . . . parts that fit perfectly because they are in perfect alignment. These parts make model building easier and much more fun. They're the kind and quality that are a real pleasure to work with.

Now to produce this kind of quality takes a lot more time, and the most careful, painstaking workmanship, rigid inspection, super know-how and precision engineering. This quality cannot be had in "ordinary" kits, or ones "slapped-out" in tremendous volume. So occasionally there may be a few pennies difference in the price, but the TOP FLITE kit gives you dollars more in TRUE VALUE!

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SUPERFORM Jetex and/or Catapult Balsa Kits

- F-86D Sabre Jet $1.29
- Douglas Skyrocket 1.29

Foreign Notes

(*Continued from page 2*)

GREAT BRITAIN

Due to reach the market by the time these words appear is an entirely new and novel British motor for multi-channel radio-controlled aircraft and boats. It is a twin cylinder, in-line diesel of .42 cu. in. (6.9 c.c) displacement, with throttle control. Designed by Lt. Col. H. J. Taplin, who built model engines as far back as 1922, it will be made and marketed by Col. Taplin's own firm, the Birchington Engineering Company, Ltd., cylinder and piston assemblies being supplied by E.D.

The motor is of the three-port type and, of course, alternate firing and has a two piece crankshaft supported in three ball journal bearings. A barrel type throttle is fitted which, it is claimed, allows the engine to be started up without priming or choking and gives an exceptional speed range—something like 500 to 7,000 rpm on a 13/9 prop. This, it is further claimed, is accompanied by extremely smooth, vibration-free running. The engine is fitted with a proper exhaust manifold to facilitate connection to an exhaust pipe, as a result of which the engine runs cleaner and quieter than conventional open exhaust motors. The complete unit is expected to sell at around £8.10s.—or approximately $24.00. (In England—Editor.) A water cooled version will also be introduced in due course.

GERMANY

Once again, the King of the Belgians Cup Contest, the most important international RC event of the modeling world, was resolved into a duel between the perennial stars fo European RC, Karl-Heinz Stegmaier of Germany and Jean-Pierre Gobeaux of Belgium. This time it was Stegmaier's turn and he amassed a two flight total of 3,247 points to beat Gobeaux by just two points. Helmut Bernhardt, third, flew, as usual, a most attractive low-wing job which, this year, closely resembled a Navion. His flying was also top class and had it not been for engine trouble in the first round, he might well have displaced one or both of the leaders.

Stegmaier's model followed his now familiar strut-braced shoulder-wing design and, of course, had his own design radio equipment with vacuum servo actuators, the same type of gear being used by Bernhardt. Gobeaux had a new low-wing ship of angular appearance with tip dihedral and Orbit equipment. All three used the German Ruppert flat-twin diesel motor and all had tricycle landing gear.

There were, as usual, two supporting events: one for single channel and one for glider. Berglund of Sweden won the former and Campolongo of Switzerland won the glider class. In all, eight countries were represented.

NORWAY

Norway's only engine manufacturer, Jan David-Andersen, is introducing an entirely new D-A .15 cu. in. International class motor for the 1959 season. D-A motors have long been noted for fine workmanship and extremely long life (our 1951 model has run for many hundreds of hours) but the earlier .15 design was strictly a workhorse in regard to performance, noted for high torque at low rpm and producing its maximum power in the region of 9-10,000 rpm.

The new .15, known as the "Drabant", is an essentially modern design, somewhat on the lines of the Oliver Tiger, featuring similar porting and a twin ball bearing shaft. Bore and stroke are 15 x 14 mm. (0.591 x 0.551 in.) and the engine will, as in the case of the Oliver, be available also

in a specially souped-up form, with opened up intake and bypass, balanced shaft and lightweight piston. Performance is said to be in the 0.30 bhp class at a peak of 15,000 rpm.

GREAT BRITAIN

A campaign against litter being left on airfields is being waged in Britain just now. "Model Flying," the newssheet of the Society of Model Aeronautical Engineers, writes: ". . . a single glass fuel bottle run over by the high pressure tire of a modern jet fighter can cause damage amounting to £500,000 . . . a length of discarded control-line wire caught up in a mechanical sweeper can immobilize it and place the whole airfield out of action for days . . . the logical end to such carelessness can only result in the loss of model flying facilities at RAF and other aerodromes. ." The lethal potentialities of the carelessly discarded fuel bottle have, in fact, been sufficient to persuade one fuel manufacturer to make a last minute switch to cans for two new fuels just introduced.

HOLLAND

The annual International Flying-Wing contest, held again at Terlet, near Arnhem, resulted in a clear victory for the German contingent. In the gas-powered event, Klinger (Germany) won, with Hedgeman (Britian) second and Wassenaar (Holland) third. Schubert (Germany) won the rubber event, followed by Scheyde (Holland) and Marshall (Britain). Zwilling and Waldhauser (Germany) took first and second in the glider class, with Holland's Osborne third.

AUSTRALIA

Australia's 12th Nationals is being held this year at Camden, New South Wales, from December 27 to January 2. Actually it is an international event, being open to overseas as well as Australian modelers. Twenty-one events are listed.

Hornet Moth

(*Continued from page* 18)

on the top wing.

FLYING: By using small balance weights and, if necessary, by warping control surfaces, achieve a long straight glide over high grass. Do not attempt a flight under power until a good stable glide is obtained. Start the engine and use only enough power to permit the model to take off and climb very slowly. Observe the model's reaction and adjust the thrust line as necessary for corrections under power. Down thrust will reduce a tendency to stall and right thrust will relieve excessive torque turns to the left. The model should take off after about a 30-foot roll and slowly climb to the left under power. A glide to the right may be achieved by using a very small amount of right rudder. By careful adjustment and trimming during the testing stages, many pleasant flights may be obtained from your Hornet Moth.

RC Aerobatics

(*Continued from page* 20)

maneuvers in your Academy of Model Aeronautics rule book.

It's a good idea to sit down with an experienced pilot and let him explain how these maneuvers are performed with real airplanes. You'll learn a lot about control pressures, weight-power ratios and a few other gimmicks that are not included in the flight instructions which come with your radio-plane kit. The writer received some valuable "tips" from Beverly (Bevo) Howard, the world-famous aerobatics expert who cuts all sort of incredible didos in his little Jungmeister biplane. Some of

the information is passed along in this article.

You've got to know what you're doing to do it right. Precision aerobatics, we would like to stress—and as the keen-eyed judges at the contests these days will tell you—is not haphazard "stunting" or push-the-button-and-hope-it-happens type of flying.

Contrary to what some of the "experts" with their "flying laboratories" will tell you, the most intricate of aerobatics maneuvers can be flown safely and consistently with radio planes, by almost any RC modeler. You can even perform at low altitudes when you learn your plane's capabilities. If your plane is properly trimmed for aerobatics, your confidence and skill will grow as you find yourself doing things you once regarded as nearly impossible.

If your aerobatics plane isn't too big and fast, you can operate in such places as ball parks or football fields. Our little aerobatics "special" has been going full blast now for more than two years without a major crack-up. It will perform three or more consecutive loops 30 feet off the desk and wind up with little, if any, loss of altitude when recovery is made.

Definite knowledge of what your plane will safely do is the secret. We've handed the controls of our plane to novices and, with brief instructions, they've been pretty much able to do the same maneuvers. But, please remember, flying precision aerobatics is to be strictly distinguished from any sort of reckless operation.

Steer clear of the word "stunting." Get it out of your mind. What you're after is precision aerobatics, just that and nothing more or less!

Most modelers construct planes from kits. So do we to save time, money and needless experimentation. If you have in mind building an all-around competition RC plane, select a kit which will produce an airplane capable of aerobatics. To name a few: Harold deBolt's (DMECO) Livewires and Aeronca Champion; Sterling's Tri-Pacer; Babcock's Breezies; Guillow's Trixter Beam; Jasco's Electra and Berkeley's J-3 Cub. Steer clear of the taper-wings. They're tricky in some of the advanced maneuvers.

One outstanding aerobatics design is deBolt's "Equalizer," plans for which appeared in Model Airplane News in November of 1955. The designer informs us that this plane is close kin to his Aeronca Champion.

Our advice to beginners in radio aerobatics is to select an aircraft close to the size of the Livewire Trainer, a little smaller or larger will not make much difference. But whatever plane you choose to build—shoot for the works. Build it with the objective in mind to perform all of the intricate maneuvers. Don't settle for just a few maneuvers and miss out on a lot of fun and helpful experience. Select good, stable radio equipment, of tested and approved makes, and escapements and servos that are as trouble-free as possible. Most of these are listed in this magazine. Your supplier or some experienced radio fliers can give helpful advice on what to buy.

The first rule in precision aerobatics is that your plane must not be heavy. Light to medium weight is the trick. Heavy planes, which build up tremendous air speeds, bring only grief. If your aerobatics plane is properly constructed, the lightest of escapements will operate your rudder or elevator without jamming. Your control surfaces, of course, must be partially balanced, light in weight and must move with-

out the slightest drag. The same principle applies to servo motor actuators.

The lightness in the construction of your aerobatics plane must be obtained with the necessary strength to withstand the strain of outside loops, pull-outs from vertical power dives and violent snaprolls. Careful building is needed and application of extra cement at critical points is just so much insurance. The center section of the wing should receive extra bracing.

As a precaution, gauze cover the leading edge and the trailing edge of the center section. Strips of two or three-inch wide gauze are ideal. Put the gauze on with cement (we use Ambroid) and rub the cement into the pores with a finger. When this is dry, rub on another coat or two. This technique is excellent for bracing around the landing gear and motor section. It adds very little weight. The gauzed wing section also protects the wing against the strap-on rubber bands.

Vibration of the wing and elevator against the fuselage must be eliminated without fail. This gremlin will be there, no matter how tightly you strap them on, unless vibration dampeners are installed where they join the fuselage. Strips of foam rubber, cut to about ⅛ inch thickness, are good. Pliobond will hold the strips to the wing and elevator contact points on the fuselage. Vibration not only is damaging to your airframe, but to your radio and control surface actuators. It causes missed signals and motor trouble.

Proper covering and doping are most important items. Framework must be protected for long life and the stress of "heavy" flying. This lightweight covering and doping job must prevent warps, such as those encountered on hot flying fields. In the winter, dampness must be kept out.

It has been our experience that heavyweight Silkspan is the most practical all-around covering material for light or medium weight aerobatic planes. It is inexpensive, easy to apply, gives a rigid framework and is easy to patch. It will compare with silk or nylon in service on the type planes we've mentioned.

Use only the butyrate type dopes. The dope must be "plasticized." The writer uses two level teaspoons of castor oil mixed thoroughly with each quart of dope, both clear and color. Put three or four coats of clear dope on the covering, or until you have a good base coat for the color application. Two or three coats of color usually will suffice. Or if you prefer to keep weight at an absolute minimum, just trim the plane with colored dope or use strips of colored silkspan for decoration.

With use of the castor oil in the dope, you obtain a covering job that will never dry out or become brittle. Some wings of this type hanging in our hot attic for years still are in perfect condition. Moreover, you can forget about warps or the need for recovering your plane anytime in the near future.

Most important part is the movable control surfaces. Your elevator and rudder, worked in co-ordination with your motor throttle, do the big job in precision maneuvers. A good, semi-balanced control surface system is easy to build. Don't settle for anything else.

Many modelers will tell you that even a very small rudder or elevator area will maneuver your plane. This is true. But it's not what you want for precision aerobatics. The writer just about doubles the recommended elevator and rudder areas. Your semi-balanced surfaces should be hinged just slightly more than a third back from

the leading edges. Pivoting can be accomplished with aluminum tubing, dowel, piano wire or even round toothpicks. They should be absolutely free in movement, without any drag or binding whatsoever. The ease of movement of your control surfaces, coupled with the semi-balance system, will permit your aircraft to perform the most intricate of maneuvers.

Not only does this semi-balanced system prevent sticking or jamming in the air, but provides a smooth, easy type of response almost unobtainable with cloth-hinged surfaces. It will work equally well on flat or symmetrical sections, and takes a great load off your actuators while in flight.

Remember, keep your control surface areas "extra light." Once you properly develop a control rig of this type, you'll find many of your old control system bugaboos vanishing. Your actuators will last indefinitely.

The larger size control surfaces are needed to snap your plane easily into all maneuvers. This is a system used in the best of real aerobatics planes. They must be "easy on the touch" and respond without having a wrestler at the controls. Your radio plane, for aerobatics, should respond instantly when you send a signal—and not in slow movements as you sweat it out on the ground. Using these large control surfaces, at first you will think your plane responds too "jerkily." Soon, however, you will learn to send a signal and get off the button, or send several quick signals where you once lingered.

It won't be long until you will truly enjoy the instantaneous response of an aerobatics radio plane that is trimmed to do the job.

Your outside loops will come without long, straining power dives to build up speed; you can snaproll with your rudder in level flight on high throttle; inside loops are a cinch from level flight, with either low or high throttle; and inverted flight is easy if you utilize the semi-balanced elevator to its best potential.

If you have enough down elevator to obtain vertical dives, your plane will fly inverted. Just pull the plane over in a loop and at the top hit down elevator. This maneuver is mentioned in particular because on some of the writer's earlier planes, without use of the balanced control system, this was a difficult maneuver to accomplish with a single-channel rig. Now it's easy. (Editor—With planes that can go inverted or tuck under in an outside entry the above may provide a climb or stall from the top of an inside.)

Your aerobatics plane, remember, is a thoroughbred. It should balance out perfectly. Build it with this in mind. The fine trimming will come in test flights. Start with moderate movement of the control surfaces and work up. Be sure that the wing is balanced; that is, both panels should weigh exactly the same when joined, and when completed, should balance exactly in the center. Flying trim should be with your motor offset, and not with wing or tail warping or angling your wing or elevator.

A word of caution: Be certain your wing and elevator are strapped securely to the fuselage. Don't bind them on with enough pressure to cause damage—just a few extra rubbers will do it. A "safety band" around your entire fuselage and over the wing is a good idea. In the strain of aerobatics, dowel rubber holders have been known to snap.

Be cautious in the selection of a motor. It must "fit" the aerobatics plane both from a standpoint of throttle use and the desired power-weight ratio. For example, we can fly our modified Livewire Trainer

aerobatics plane with a motor smaller than the Torp .15 we use, but not with the "reserve" power needed for some of the maneuvers and unassisted take-offs. Guard against a rough running motor and one which is difficult to start.

For aerobatics flying, your motor throttle of low, medium and high speeds should work as nearly perfect as you can get it. Any type of throttle arrangement that works well is good enough. Adjust the motor speeds to where you can shoot touch-and-go landings and spot landings on low throttle and have "plenty of steam" when you hit high throttle.

Your inverted (fuel) system must be without flaw. The motor must run as smoothly in inverted flight as upright, and not conk out in dives or straight up climbs. There are several good tanks on the market, the DMECO swivel tanks to mention one. But perhaps the best and cheapest arrangement is the balloon tank. Whatever fuel system is chosen, remember that the tank—or the overall motor and fuel setup—should be easily accessible. Constant inspection and servicing is needed here. Aerobatics eat up fuel fast, so assure yourself a motor run of at least five minutes.

After a day of flying an aerobatics plane, it's a fine idea to "clean it up." Use two cloths and Aero Gloss Plane Kleener, or some other good solvent. This is important. It keeps the plane looking fresh and new, rids it of oil and dirt and actually keeps the airframe from "gaining weight" over the months.

As a note to beginners who desire to fly aerobatics, the writer will mention that his modified Livewire is equipped with a compound escapement to operate the rudder and, on the third signal, works a single escapement for elevator and motor control. As simple as it is, good results are obtained, thanks largely to the lightweight, semi-balanced control surface. It is arranged so that elevator always is up when signaled on high motor speed, and down elevator on low speed, but with the throttle opening as plane goes into the dive.

Now that radio equipment is better and lighter in weight, regular multiple channel rigs can ideally be installed in the type aircraft we've outlined. We used the single-channel rig mainly because of its simplicity. All equipment inside an aerobatics radio ship should be snugly installed so that no bouncing around will take place during a workout.

Mount escapements or servos tightly and give them thorough periodical inspections, as you do the rest of your plane. It is our preference to mount the actuators firmly against bulkheads or the fuselage using a thin piece of foam rubber or felt between the actuator mounting and the wood to which they're attached.

If battery boxes are used, be sure and remove the batteries immediately when flying is finished. Also, "rubber down" the batteries even if you use a good type battery box.

For building your aerobatics plane, we consider it impractical to outline any set formula for the size of your semi-balanced control surfaces or to set up hard and fast rules of construction or selection of a particular type of aircraft. Beginners simply can enlarge the area of the surfaces shown on the plans in the kits. We have found the range of increasing control surface size not at all critical. The question of the best type of wing airfoil section to use is not hard to answer. Most any of the recommended types work well in aerobatics. Some modelers have definite preferences.

The writer does not. We have three wings for our Livewire aerobatics plane, ranging from the standard kit wing to one with a symmetrical section. All of the maneuvers can be performed with either of the wings. (Editor—The symmetrical, or other convex undercambered sections, make outside maneuvers easier or, other things equal, do not necessitate ultra large elevators.)

Enjoy your aerobatics flying. Don't get bogged down in a bunch of technicalities or strain the pocketbook. All this is not needed. The writer once spent $250 building what he then thought would be an ideal radio aircraft, both for just plain flying and the advanced maneuvers. It flew good but was heavy and fast. Finally it splattered—a total loss—because of too great an air load on an unbalanced elevator and the elevator servo. Other radio modelers have had the same experience. It took five years to develop the aerobatics airplane we've outlined, finally boiling down to one little word—"simplicity."

As you build and fly your aerobatics airplane, more and more pleasures will come your way. You will learn new tricks and a different system of timing on the transmitter. One of these will be a quick comedown from high altitudes for smooth precision spot landings. Maneuvers in the glide will be safe, quick and exacting.

Our urging to any radio modeler is don't delay any longer—get yourself an aerobatics buggy now. You may have to learn to fly all over again, but it's sure worth it!

Royalite

(Continued from page 28)

Royalite large enough to form each fuselage half in one piece. Royalite can be procured in sheet sizes up to 52" x 90" from the manufacturer, though we obtained ours as scrap in smaller pieces, approximately 10" x 24".

In the case of our model, due to the limitations of our kitchen oven, each fuselage half was made in two pieces: a fuselage aft section and a fuselage forward section.

Forming is easy. Turn on your kitchen oven to 350 degrees and let it come up to temperature (about ten minutes). While the oven is heating up, prepare your work area. Lay newspapers down on the floor under the form blocks. See that the base plate is attached to the under side of one of the form blocks and that the form blocks are properly waxed. Also, have your "forming template" within easy reach. Oh yes, wear cotton gloves—the Royalite gets pretty hot. A large screwdriver to help pry your form block out of the formed shell is also handy.

Ready? Let's form! Place a sheet of Royalite in the oven for approximately 90 seconds, or until it gets limp and raglike. Do not leave the Royalite in too long as it will overheat, resulting in surface bubbles. After it is ready (forming temperatures of 1/16 inch Royalite is 280 to 300 degrees F), take it out of the oven and lay it down on the form block with the rough textured side down. Immediately slide the "forming template" down, stretching the hot material over the form block. While holding the "forming template" down, work out any imperfections by rubbing with the hands. A helper is useful here. If you should make a mistake, you can reheat your Royalite part and it will return to a flat sheet status again ready for another forming attempt. However, don't reform a part over four times as the repeated heating weakens the Royalite. After the Royalite has cooled (one to two minutes),

lift the "forming template" off of the form block and remove the formed part from the block. Royalite shrinks when heated, so allow extra length to your sheets prior to forming. Repeat the above procedure for each section of your fuselage. Be sure to remove the base plate from the first form block and attach it to the other form block before forming parts for the opposite side of the fuselage.

You are now ready for trimming. The first operation involves cutting all fuselage sections down to the correct size. Lay the aft fuselage section over the form block. Using a knife, score the Royalite even with the form block. Remove the formed part and break away the excess material at the score marks by flexing it back and forth. It may be necessary to use tin snips to make radial cuts down to the score marks in areas of curvature. This permits the excess material to be broken away in smaller pieces. Repeat the above steps for all fuselage sections. Lay one of the aft sections over its form block and trim its forward end so that it is 90 degrees to the horizontal axis of the fuselage. Now, place the forward section of the fuselage over the form block so that it is under the aft section which you just trimmed. Score the front section to match the aft section joint. Remove parts and trim accordingly. Smooth the joints by rubbing the trimmed surfaces over rough sandpaper placed on a table. Trim front and rear sections of opposite side of fuselage in a like manner.

Cementing comes next. Special cements are used with Royalite: Testors Liquid Plastic (bottled) cement for butt joining work, and Hysol type 1-C for wood to Royalite and for joints where special strength is needed and for filling. First lay some wax paper over the form blocks at the area of the joint between the front and rear fuselage sections. Then thoroughly moisten the joint edges of the fuselage sections with Testors Liquid Plastic cement. This is easily done by using an eye dropper to apply the cement. About three to four applications per surface are sufficient to get the surfaces tacky. Lay the fuselage sections in place on the form blocks and press fuselage sections together until a bead develops at the joint. Secure the parts in place with large rubber bands. Leave to dry over night.

After the joints have dried, remove fuselage halves from form blocks. Dress down the surfaces at the fuselage centerline with coarse sandpaper. Keep sanding until both fuselage halves make a smooth joint when held together.

Cut ¾ inch doubler strips from some Royalite sheet. Cement these strips to the inside of the joint between the fuselage front and aft sections. Hold in place with clamps and weight. Let dry over night. Also install doubler strips, on one fuselage half only, along the entire joint at the center line of the fuselage. Hold in place with clothes pins and let dry over night.

After doublers have dried, place both fuselage halves together and hold in place with rubber bands. Now cut opening in fuselage over cabin area. Tin snips will do a nice job here.

After the fuselage opening has been finished, remove the rubber bands and disengage the fuselage halves. Now, make a bulkhead out of ¼ inch plywood to fit the fuselage contour at the rear landing gear. Make this bulkhead 1/16 inch undersize all around.

Make a "forming template" and base plate to fit the bulkhead and form a Royalite bulkhead. Trim the bulkhead to provide 1¼ inch flanges. This will provide reinforcement for bolting on the landing

(*Continued on page 61*)

Complete Listing

MODEL AIRPLANE NEWS FULL SIZE PLAN SERVICE

The editor's selection of all time favorites, including completely new combinations of the greatest designs. All types!

PLAN SETS 50¢ P.P.

55. DETROIT STUNTER: U/C .29-.35.
HORNET MOTH: FF, Scale, .02-.049.
THE BARDON: Wakefield.
D'troit St.: McDonald's Strathmoor, Nats favorite. Bardon: Canadian and US Nats winner, tops in rubber.

54. SATELLITE: Hunter's FF, .19-.35.
SUPERMARINE S-6B: U/C Scale, .09-.15. Satellite is top contest free flight '58-'59. Schneider racer, S-6B seaplane is one of FAST club's best projects.

1. GIMLET: RC Low wing .049.
ROYONO: Contest FF A&B.
So low wings RC are new? Gimlet started it all!

2. COMPER SWIFT: ½A, FF, Scale.
MULVIHILL WINNER: Rubber.
THE LIEUTENANT: UC Stunt, .29-.35.
If it's scale you like, the Swift is a wonder!

4. SURE FUN: UC Sport, .29-.35
PROFILE SILVAIRE: FF Profile, ½A.
ZEPHYR: Rubber, Fuselage
Control line on floats. Sport Gassie.

6. HIGGINS CABIN CRUISER: RC Boat, .09-.19.
FOKKER D7: Scale, U/C, .29-.51.
The great all-time favorite? Try the Fokker D-7.

7. WORLD CHAMP GL.: Nordic Winner.
HI BOY: Cabin Stunt, Palmer-Goyet, .29-.35
POW WOW: Bob Palmer stunt, .29-.35
Collector's item—two Palmer models!

8. GEE BEE: Scale U/C, .19-.25.
DRAKE: FF, flying boat, .049.
DURANITA: FF, bipe, .049.
More people built the Drake than any other ship.

9. AEROCOM'DER: Scale, U/C, 2 .15.
MARS: Bob Palmer stunt, .29-35.
NOBLER: Aldrich's Nats Winner, Stunt, .29-.35. **Palmer and Aldrich, plus a twin ukie. Imagine!**

10. SMOG HOG: Bonner's Multi RC, .19-.35.
STRATOLINER: 2 Half A, U/C.
GUARDIAN: U/C Scale, .29 up.
Greatest Multi RC of all time—a beauty!

11. GAMBLER: Mirror Stunt Winner, .29-.35.
DOUGLAS B-66: ducted fan FF, .049.
B-66, the ducted fan job that beats all others.

12. WHIRLING WINGS: Sikorsky XH-5, .15, 'copter.
BREEZY: Small field RC, .049.
SPITFIRE: Stunt, semi-scale, .29-.35.
P. Schoenky, 'copter master—his Sikorsky!

13. T-CRAFT: FF scale, .049.
FENO: Combat, stunt, .29-35.
PADDY'S WAGON: Contest FF, .049.
Paddy's Wagon—one contest job ok for beginner.

14. HEATH PARASOL: RC, FF, Scale, .075 .09.
GUARDIAN: Nats carrier winner, .29's.
SHARPIE: FF Sport, .02-.049.
—Guardian a dilly.

15. RE-8: WW1, U/C. .29-.35.
FLAPPING WINGS: Rubber, ornithopter.
BOOMER: FF, sport, pusher, .049.
Can planes fly like birds? Ornithopter sure does.

18. PAACKHORSE: PAA Load FF .15.
AIRNOCKER: Scale, FF .049.
What model hit the jackpot? Airknocker—the Champ.

27. FLAMINGO: RC Amphibion, .15-.23.
UPSTART: Best B-C FF, on .29-.35.
NACA planing hull make Flamingo stand-out RC. UPstart—it goes!

40. MUSTANG: U/C Scale, .29.
BI-GONE: Sport, FF, ½A.
GLIDERS FIVE: HL Sheet.
Mustang, Jim McCroskey's Nats winner. Bi-Gone, nifty bipe.

43. EQUALIZER: .15 to .19 multi, RC.
QUICKIE TRAINER: Speed, .29.
AMAZOOM: FF, contest, .15.
deBolt's best, the Equalizer? Amazoom—Stan Hill's hi-thrust.

44. CONVAIR'S DELTA: Jetex FF.
LIL DYNAMITE: .15 stunt, UC.
SWAT: ½A, FF, contest.
A trio of exceptional planes.

45. ASTRO-HOG: Multi RC, .29-.35
MITCHELL: Profile, .09's, .15's UC.
Dunn's low wing radio—tops! Nothing matches this multi. The Mitchell a fine flier.

46. PROPJET B-47D: U/C, .15's.
RUFFY: Stunt, .29-.35.
NOR'EAST'ER: Nordic glider.
B-47D, beaut of a project Ruffy: big winner—it's new!

47. FOKKER E-3: 1/2A, FF, Scale.
NAVY RACER: Rubber, semi-scale.
WOODY: .29-.35, UC Combat. Hot!
E-3, beautiful model, fine flier.

48. SPORTCOUPE: .09, U/C, Stunt.
WHATIZIT: .35, Combat, Wooten.
SWIF-F-FT: Jetex, two sizes!
Whatizit, settles fuse-wing debate!

49. CONQUISTADOR: .29-.35, U/C Stunt.
TWO-STAGE ROCKET: Jetex (2).
Stunter is a thing of beauty, and it flies as well as it looks!

50. DUMBO: PBY Scale, U/C, .19's.
FRENCH OLDTIMER: 1914, ½A, FF.
Dumbo, the Catalina, man-sized ukie, takes off, lands on water or ground.

51. AMERICANO: .15 FF, by Blanchard.
BOMARC: Scale, Jetex, missile.
CUTLASS: Sport U/C, .049's.
Scorpion power makes Bomarc terrific flier. Americano is National Champ's very latest.

52. GAUCHO: RC Stunt, .29-.35.
THE CHAMP: Best U.S. Wakefield.
LAIRD SOLUTION: U/C Scale, .15-.2
Gaucho, Argentine Champ, does pattern inverted. Champ, a single Wakefield

53. SNAP: Sport U/C, .19-.23.
PELICAN: PAA Cargo, .049.
WINDMILL: FF, 'giro, .02-.049.
For proto take-off and landing realistic Snap tops 'em all. Other two, collector's items.

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23. Humdinger, Old Faithful, Cessna 180
24. Aero Bat, Snoopy, Seagull
26. Corsair, Gyro-Glider, Santanita
29. Cougar, '55 Nordic Winner, Dizzy Boy
30. Great Lakes Trainer, Triple Threat RC
32. Mig-15, Fifinella, Coquette
33. Skyraider, Dunwoody's Nordic, Flexi-Bell-I
34. Corben Super Ace, Cessna 310, Profile Lightning
38. SE-5, Curtiss Robin, Nobody
42. Tenderfoot, Big D, Westwind RC.

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List additional plan orders on separate sheet.

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gear. You may make two of them set ¾ inches apart for a sliding escapement tray if you like, as we did.

Mount the bulkhead in position. Clamp in place and allow to dry over night. This bulkhead thus serves three purposes, a bulkhead, a landing gear attachment, and an escapement mount.

Add a Royalite bulkhead at the nose and a 3/16 inch diameter doubler. Cement in place at the same time the landing gear bulkhead is being cemented. The next night, thoroughly moisten fuselage joint areas with cement and join the two fuselage halves. However, avoid too much cement since it dissolves the material and can deform the shell if applied too heavily. Hold in place with rubber bands and install clamps at landing gear bulkhead. Let dry over night.

Next comes clean up and painting. Construct battery tray and receiver mount. Secure engine mounts with bolts and Hysol type 1-C cement. Make landing gear and install wing rubber attachments. Bolt nose gear in place on Royalite bulkhead. Make nose cone and cement in place. Allow to dry over night. Use Hysol cement as a filler to cover up joint depressions, filing it down after 12 hours (at 36 hours it's too hard for easy filing).

Spray hot fuel proof dope over model. Apply four to six coats to give good coverage, being careful with the first coat, not applying it too thick or wet, which could affect the Royalite. One precaution—do not dope over thin sections of Royalite (under .02 inches thick) because the dope attacks the surface of the Royalite and thin sections will wrinkle and crack. However, no special precautions are necessary for heavy sections over .02 inches other than mentioned above.

In summary, Royalite model construction is fun and new. Streamlined shapes which were difficult to construct out of balsa are now easy with Royalite. Just remember that you are not limited to forming concave surfaces only. Convex areas will require a form block which will have to be pressed in place when forming. These auxiliary form blocks are called helpers and permit a wide latitude of forming techniques.

The writers would be glad to answer questions, and also to assist putting interested modelers in touch with sources of supply for Royalite and Hysol cement. This article has only scratched the surface of Royalite model construction. Warning—if you do try it, nothing else will ever do!

The Bardon

(*Continued from page 23*)

shown on plan, and tack cement until all trimming has been completed. Trimming will be a lot easier if wing is warped to have one degree washout on the left wing panel and one degree washin on the right. This set up keeps the right wing up under power and the model is not as prone to spiralling in. Add 1/16" downthrust and 3/32" sidethrust to the noseblock. Position the rudder for right turn in the glide.

Hand Glide: If model stalls, reposition the pylon backward until it disappears, and you have a slow, right glide. Put on 100 hand turns. The model should climb away smoothly and quickly to the right. If it power stalls, add right thrust no more than 1/64" at a time. Keep increasing turns and eventually you'll have a tight right spiral climb, with no loss of height at the end of the motor run. You will notice that the prop pulls right to the last turn since there is no CG shift.

The 50-gram motor should be made up as 12 strands and will be taut between hooks. The safe turns that can be realized under this set up are 600, which should give you a run of 50 seconds. Glide attitudes of a model can be deceiving to the eye, so bring along a stopwatch to your trimming sessions. Make small changes in CG and incidence angles; use the same number of hand turns every time, say 250, and check each flight. This way you will realize the best potential of this model.

MAN at Work

(*Continued from page 4*)

steamed out the night before when it was crated. Yet this ship almost did "luck out." One Wakefield flier was offered new Perelli rubber, said he didn't need it, then fouled up on rubber at the finals. Chance taking has no place. In contrast, many of the foreign experts can adjust a Nordic between flights at the finals to allow for wind changes. Most people don't know that much about their "luck out" airplanes to take such "chances."

Eliminations don't help either. Too many "luck out" guys get hot as a pistol on the one occasion and knock off people of championship caliber. Nor can most people get to scattered eliminations. We do include Wakefield and FAI gas and Nordic at the Nats (local meets, ho, ho) only because we can't sweep them under the rug. Who dares modernize the Annual Picnic where practically everybody must get a trophy so his little heart won't be broken? Perhaps, if our clubs weren't exclusively fly-for-fun happy, we might get somewhere. On with the next rat race!

• • •

► With a couple of fellow editors, went out to Republic to judge the annual employees' contest sponsored by the firm's very active club, the RAMS. Ships, planes, cars—no holds barred. You run into everything from glass-blown coaches and horses to B-17's scaled in brass, perfect, only a couple of inches in span. Hordes of plastic models from kits floored the hapless judges. Employees had bought 4000 kits of the 105 alone—fortunately only a couple of dozen popped up. You looked for gaps in the seams, forgotten red and green tip lights, thumbprints, etc. Just one big happy family, but the RAMS sometimes make the Recreation Director feel like the old woman in the shoe.

There was the time CO2 cars were demonstrated at a community dinner. When one jumped the wire, went up one wall, across the ceiling, down the other wall, and skittered about under tables, the poor guy thought, "Oh those blankety blanks, they've sneaked in a model airplane!"

Then there was the telegram from the Navy saying a "carrier" was arriving by air in three hours. Oscar, with visions of the Forrestal in mind, and by air yet, scorched the premises before a passing modeler told him about the Navy Carrier Event.

• • •

► In Dec. MAN at W misquoited Zeigenfuse, on why pylon gassie jumped duration when flown right power, right glide; compared with right power, left glide. To straighten out the six modelers who haven't slept in two months since, it's a matter of stabilizer area you'd see when looking down on ship. Stab tilt for left glide, shows less area in right power turn; whereas stab tilted for right glide, shows more area in right power turn. We hope!

ADVERTISING INDEX—FEB., 1959

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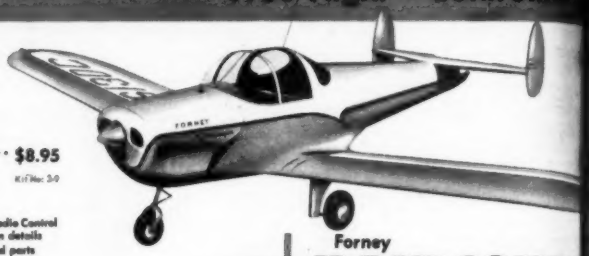
For Radio Control—
Free-Flight—Controlin



1-1/2" Scale **PIPER** 54" Wingspan —

"COMANCHE"

Newest King Size Model... $8.95
For .065 to .15 Engines — Radio Control
For .09 to .19 Engines — Controline
Kit No: 3-9

Piper Aircraft's latest four-place personal airplane is an ideal design for low-wing radio control and controline flying. The kit model is ruggedly designed and adaptable to a number of model engines. Easy to build and fly too!

- Die cut Celluloid Windshield
- Formed Landing Gear
- Hardware
- Tapered Balsa Trailing Edges
- Full Size Plans with both Radio Control and Controline installation details
- Die cut balsa and plywood parts
- Silkspan Covering

"BUSTER"

For Radio Control Pylon Racing - Controline Flying

For .15 to .35 Engines — 3" Scale — 48" Wingspan **$9.95**
First scale model kit for Radio-Control Pylon Racing, - also for Controline flying. 1/4 size of real 16' wingspan "Buster" racer. Kit No: 3-8

- Operating Wing Flaps
radio or controline actuated

$8.95 Kit No. 3-4

CESSNA "172"

BIG 1½" SCALE — 54" WINGSPAN FOR .09 to .19 ENGINES

- Adjustable Ailerons
for manually setting trim

Here is the latest scale "Cessna" that is a "natural" for radio control. The big proto ship takes-off and lands with "hands-off" control. The model handles just as easy! It's a model builders dream ship!

Radio Control — Free-Flight — PAA-Lead

"PIPER CUB J-3"

For .15 to .23 Engines—71" Span—9" Scale
Weight: 4½ lbs. — 700 Sq. In. Wing Area — 14.3 oz. Loading

The "Piper Cub J-3" needs no introduction. Most famous of all light aircraft, it's a natural for R.C. or Free-Flight flying. The six foot span permits the extra R.C. installation that you dream about. This is a rugged, detailed, flight proven design. Full-Size Plan with R.C. installations, Authentic Decals, etc.

$10.95

Army Liaison YL-3B **"HELIOPLANE"**
For .049 to .14 Engines — 39" Wingspan — 1" Scale

With a large prop and full span flaps, the full-scale "Helioplane" can take-off with full load in 300 feet, maintain level flight at 50 m.p.h. Top speed is 150 m.p.h. Perfect for model work, you will hear more about this amazing airplane in the days to come.

$4.95

"WACO CABIN"

1½" Scale — 52" Wingspan — For .14 to .49 Engines

The 1½" scale "Waco" spans 52". Weight with all radio equipment installed is 4½ lbs. 630 sq. inches wing area. Model is designed for multiple control through compound escapement systems. In flight it is very stable and easily controlled with rudder only type installations. Rudder, elevators, motor and steerable tailwheel may be actuated. Radio equipment is removable as a unit for convenience.

Kit No: 3-6
$9.95
less wheels & wheelpant material

Piper "TRI-PACER"

Four place cabin monoplane with interconnected ailerons and rudder. Powered by 125 or 150 hp. Lycoming Engine. Maximum speed 139 m.p.h.

1½" = 1' Scale—44" Wingspan

For .065 to .099 Engines—Radio Control
.035 to .075 Engines—Free-Flight
.075 to .15 Engines—Controline

$5.95

$16.95

NAVION "Super" 260

- Full Size Plans with Radio Control & Controline Installation Details
- Molded and Embossed Celluloid Canopy
- Vacuum Formed Polystyrene Cowl

2" Scale — 68" Wingspan
6½ Pounds with R.C.
720 sq. in. Wing Area

.29 to .35 Engines Radio Control
.23 to .29 Engines Free-Flight
.29 to .65 Engines Controline

This beautiful scale replica of the famous "Navion" is a fast, rugged and truly different R.C. or Free Flight design, easily adapted to Controline Flying. Thrill to its flashing performance and smooth response. As a free-flight, it will give you experience and confidence in low wing designs. Big, roomy, and well engineered, it will set the pace whenever it's flown. Easy to build!

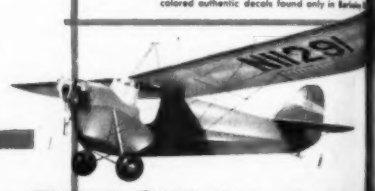
Forney **"AIRCOUPE"**

For Radio Control— Free-Flight— Controlin

Kit No: 3-7 — 1½" Scale — .074 to .29 Engines

$7.95

The kit is very complete in true Berkeley tra with prefabricated wood parts, silkspan, landing and hardware, plus the super-detailed plans an colored authentic decals found only in Berkeley



AERONCA "C-

1½" Scale—54" Wingspan
For .074 to .15 Engines Kit No: 3

Available as a 36" span for "½A" Free-Flight as a 54" span for Radio Control, Free-Flight

For .049 to .075 Engines—
.035 to .075 Engine
.074 to .15 Engi

De Havilland "BEAVE

1" = 1' Scale—48" Wingspan
- Formed Metal Ri

FREE-FLIGHT: Contest performance possible. Eas and an excellent design for less experienced

RADIO CONTROL: Recommended for precision flying two-speed work, shooting landings, etc. Realistic

CONTROLINE: Long moment arm provides full rang on take-offs, landings, and throughout flight. Very

$14.95 **CESSNA "170**
For Radio Control — Free-Flight —
For .25 to .35 Engines — 72" Span —

Controlling your "Cessna 170" by Radio is a thrill forget! Perfect in scale, rugged, stable in all at spanwire in control, with good wind penetration gear location is ideal for extended take-off run than average size makes it easier to control in

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In Berkeley Kits you get the "extra": extra detail on the plans and decals; - extra hardware found only in Berkeley kits; - extra precision in engineering and structure; - and above all that, is the extra fly-ability that has made Berkeley World famous.

TISS A-12 "SHRIKE"

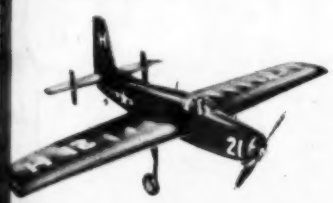
REPUBLIC "P-47 THUNDERBOLT"

CURTISS SBC-3 "HELLDIVER"

TISS "GOSHAWK" F11C-2

GRUMMAN "F-8-F BEARCAT"

NORTH AMERICAN "T-28"



GRUMMAN "GUARDIAN"

NORTH AMERICAN "AT-6 TEXAN"

CURTISS A-12 "SHRIKE" $5.95
For .09 to .19 Engines – 33" Wingspan
Metal Ring Cowl, Rounded Edge Planking

***CURTISS SBC-3 "HELLDIVER"** $5.95
For .09 to .29 Engines – 25-1/2" Wingspan
Metal Ring Cowl, operating flaps, rounded edge planking

CURTISS "GOSHAWK" F11C-2 $4.95
For .074 to .15 Engines – 23-1/4" Wingspan
Metal Ring Cowl, Metal Wing Struts, Plastic Dummy Engine

GRUMMAN "F-8-F BEARCAT" $5.95
For .09 to .19 Engines – 26-1/4" Wingspan
A new kit design throughout. Rounded edge planking

North American "T-28" $6.95
For .23 to .36 Engines – 30" Wingspan
Metal Cowl; Tricycle Gear; Step Keel Alignment

Grumman "GUARDIAN" Semi-Scale $8.95
For .19 to .36 Engines – 53" Wingspan
Metal Cowl; Designed for Stunt and Navy Carrier

North American "AT-6 TEXAN" $4.95
For .19 to .33 Engines – 31" Wingspan
Metal Cowl; Embossed Canopy; Army and Navy Decals

Curtiss HAWK "P-6E" $4.95
For .09 to .15 Engines – 24" Wingspan
Metal Cowl; Metal Wheel Pants; Colorful Decals

"P-40 WARHAWK" Semi-Scale $7.95
For .19 to .35 Engines – 45" Wingspan
Metal Cowl; Stunt Flaps; Flying Tiger Decals

"SHOESTRING" $5.95
For .14 to .36 Engines – 28" Wingspan
Metal Cowls; Spinner; Wheel Pants; Landing Gear

CESSNA "195" $6.95
36" Wingspan—For .19 to .49 Engines,
Metal Cowl, "Step-Keel Fuselage" construction

Beech "T-34A MENTOR" $6.95
For .14 to .29 Engines – 33" Wingspan
Air Force Trainer, excellent flyer, easy to build

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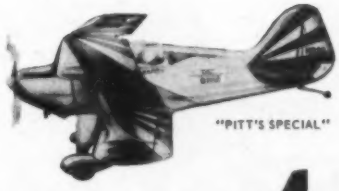
For .09 to .36 Engines – 28" Wingspan
Metal Cowls; Spinner; Wheel Pants; Step-Keel

"PITT'S SPECIAL" $5.95
For .19 to .33 Engines – 25" Wingspan
Metal Cowl; Metal Wheel Pants; Decal Flare Design

*** Republic "P-47 THUNDERBOLT"** $5.95
For .15 to .29 Engines– 32¾" Wingspan
A new design throughout. Rounded edge planking

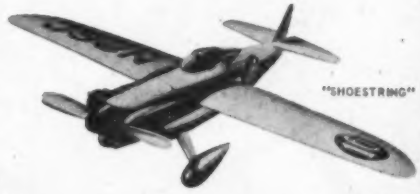


"PITT'S SPECIAL"

"MINNOW"

BEECH T-34A "MENTOR"

CESSNA "195"



"SHOESTRING"

(*) These kits feature Berkeley's Rounded-Edge Balsa Planking for easier "solid appearance" construction.

CURTISS HAWK "P-6E"

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For .15 Engines
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- Die cut Celluloid Windshield

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Controliner

- Full Size Plans with Controline installation details
- Plastic Dummy Engine
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The plans include a wealth of scale details which will appeal to the master craftsman. Inexperienced ... find construction simplified by the ... and assembly technique.

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"MARK 40 ZILCH"

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For .099 ... .15 Engines
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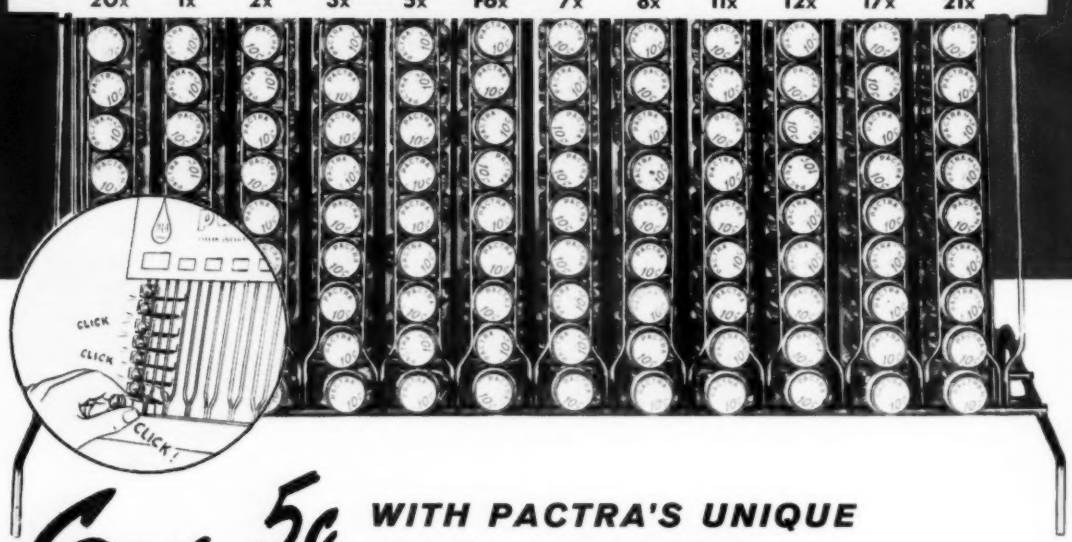

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